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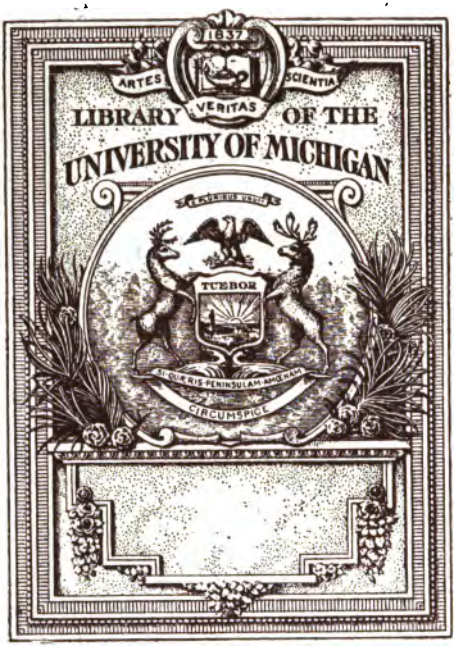
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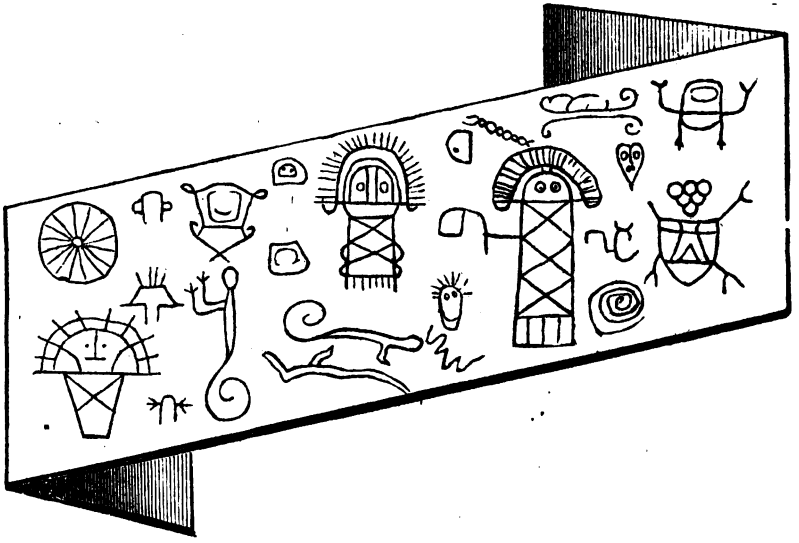

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Edited by ... ... JAMES RODWAY, F.L.S.

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*Some Spanish Accounts of Guiana.**

By the Editor.

THREE hundred years ago, on the 6th of February 1595, Sir WALTER RALEGH sailed from Plymouth to search for the Kingdom of "El Dorado."

The New World had been discovered a century before, and Spain in virtue of her prior claim had been searching for countries abounding in precious stones and gold. Already, she had discovered Mexico and Peru, and her pioneers had heard rumours of another great country somewhere in the centre of South America. Such rumours had led to the discovery of Peru, and there was no reason why not one but several such countries should not lie hidden in that great wilderness drained by the mighty rivers Amazon and Orinoco.

RALEGH had heard of "El Dorado" the Gilded King,—his city of Manoa, and the great inland sea of Parima on which it was situated. Spanish adventurers had already spent years in search of it without result beyond sickness and death. It was an age of adventures. Men risked

* For the materials of this paper I am mainly indebted to Mr. J. H. Reddan of the Foreign Office, who has had opportunities of consulting the Spanish Archives.

their lives for an idea—RALEGH would go and discover the treasure where the Spaniards had failed. No matter that he would have to pass through the Land of the Cannibals, run the risk of being eaten by tigers, be exposed to sickness and death at every step, he would show that Englishmen could beat the Spaniards any day.

Virtually there was always war beyond the seas, whatever might be the state of affairs in Europe. Spain's right to the whole of America was disputed by every other nation. Let her occupy the country and then there would be a shadow of right on her side—otherwise all parts not actually in her possession were open to all. Guiana had never been conquered. Two or three attempts to settle along the coast had proved disastrous. The man-eating Caribs were guardians of the coast and the mouths of the great rivers. Like the "Hardy Norsemen" they held their own against all others. The coast of Guiana was their's—their hunting ground—where for want of game of other kinds, they chased the more gentle Arawaks. On the islands, and on little spots of rising ground in the swamp behind the fringe of couridas, they lurked when not on the war-path, and from these places made long excursions in their corials.

Hidden away in every little river and creek were the so-called towns of the Arawaks. Made up of a number of palm-leaf covered sheds they differed little from the Indian villages of to-day. There was however one great addition, the result of the circumstances of the time. Now the Arawak has no enemies—then he was in continual fear. Like a hunted animal he was compelled to hide himself, but unlike the beast took other precautions against the enemy. The large corials of the Caribs

could sail round the coast and up the great rivers, but were hardly able to float in those shallow streams so well-fitted for the wood-skins of the Arawak. Then, a fort, surrounded with manicole palisading, was erected in every village. Like most savages the enemy aimed to surprise the village at night and carry off as many as they could capture. At the least alarm however the villagers rushed to their fortress and defended themselves as well as they could with showers of arrows driven through slits in the palisading. The Caribs, undaunted by such a stubborn defence, used fire-brands on the palisades, and even tipped their arrows with cotton soaked in crab oil, which when lighted were shot at the palm thatch. Presently, if the enemy was successful, the building would be in flames, and its defenders rushing away to gain the forest. But, the Caribs were prepared for this, and although some men would manage to escape, women and children were often captured. Then, the victors returned to their little island or sand-bank to kill and cook their "game" at leisure.

In the mouths of the great rivers also lived the Warrows—a stronger race than the Arawaks—able to hold their own against the cannibals. But even they had to take precautions and fight now and then to retain their positions, not only with the lords of the coast but with the flood. This latter danger was undoubtedly the reason why they built their huts on piles, which led the early voyagers to describe them as living in the trees. Unlike the Arawaks they had no provision fields, but lived mainly on fish and the produce of the eta palm.

Dutch, French and probably English trading vessels, now and again passed along the coast and entered

the mouths of the rivers. It was from the Indians that sailors first learnt the use of the hammock—a convenience almost indispensable in low-lying countries. The Dutchman also very soon took to the use of tobacco and it was mainly from this coast that he procured his supplies. Then, there was balsam copaiba, used largely as a dressing for wounds, and gum animi, which had a reputation as a diuretic medicine. Cotton, or tree wool as it was called, was another article of trade, which with letter-wood and a few curios made up the list. Of course all the traders looked for gold, and the " moons" which the Indians wore in their noses were bartered for everywhere.

Except to these traders nothing certain was known of Guiana. It was marked *Cannibalor Terra* on the maps and was reported as a most dangerous coast for the white man. What the Spaniards knew of it they kept to themselves, and it appears that RALEGH gleaned his knowledge from Spanish letters taken from captured vessels. Dutch traders are reported as having established a depôt in the Pomeroon river as early as 1580, but this was probably nothing more than a temporary expedient to prevent long delay on the arrival of a vessel. Trade was carried on in much the same manner as was done in the West African rivers. A vessel arrived with a lot of negotiæ, and the Indian Captains or heads of families promised to supply cotton, tobacco, &c. in exchange. Then came the delay until these things were collected, which sometimes kept a vessel for months. It was obviously an advantage to have things ready against the vessel's arrival, and thus the first depôts were established for that purpose. How-

ever, although it is quite certain that trading posts were established about that time, there is no real evidence of anything like a settlement for some years afterwards.

Very little was known of Guiana by the Spaniards, in fact even its discovery by COLUMBUS was disputed on behalf of four or five other voyagers. Here and there we find evidence that some of the early adventurers had gone there in search of gold and spleen stones, but nothing to show that the Government had any official knowledge of the country. DIEGO DE ORDAS in 1532 appears to have received a governorship of the territory bordering on the Orinoco, on certain conditions, but as he did not comply with these conditions it may be presumed the arrangement fell through. In 1536 an "Asiento" was made with DON JUAN DEEPES (?) for the conquest of "Nueva Andalucia," and what is curious about this is that it was granted through the influence of DON MATIAS ROBERTS, probably an English Merchant. In 1540, FRAY GREGORIA BATELA, Bishop of Cartagena, gave his opinion on what should be done to occupy the Provinces of Caura, Guiana, and the mouth of the Orinoco, as follows*:—

"What appears to be very necessary at present to bring the Aruaca Indians to peace, and the knowledge of Our Lord, and the service of His Majesty, both in the island of Trinidad, Guiana, and other neighbouring nations; as all are poor and naked; and for the protection of those who might have to treat with them; and also for the safety of the Indians from the Caribs, their enemies; is the following:—

"Firstly—That a village of Christians be founded on

* Arch. de Indias; Audiencia de Sto. Domingo: Reports.

the bank of the river Orinoco, in the Province of Caura, or in a part of Guiana, where a hundred men may be sent and thirty soldiers, paid by Your Majesty."

Nothing came of this recommendation, and four or five years later we find RODRIGO DE NAVARRETE writing an Account of the Provinces and Nations of the Aruacos, who inhabit the coast of Tierra-Firme two hundred and more leagues from the island of Margarita. He says* :—

" The provinces of the Aruacas are situated on the coast and territory of the Rio Marañon, and extend along the coast for more than two hundred leagues. The coast and land is all low. The villages are built on the banks of the rivers, and there are some rivers very large and of great volume of waters which flow through the country and empty themselves into the sea :—

" The principal river which they inhabit and which they say is the source *(cepa)* or fountain head of the others is called Bermiji (Berbice ?), another is called Curetay (Corentyne ?), another Dumaruni (Demerara ?), another Desguixo (Essequebo ?), another Baorome (Pomeroon), and another Moraca (Moruca).

" The banks of these rivers are very fertile, and fish abound in all of them ; the country is rich in game ; and animals of all kinds are plentiful. There are great plains of excellent pasture lands for cattle ; as well as extensive lands for agriculture.

" Those Indians are very industrious and are extremely generous. In winter they devote themselves to labour of various kinds, and in summer they make war upon their enemies the Caribs, with whom they are in mortal

* Arch. de Indias ; Patronato.

enmity; and with whom they consider it the greatest glory to wage war.

"The rivers, on the banks of which they are now settled, were, as they affirm, formerly under the power of the Caribs. According to tradition; as they say, on the authority of their ancestors; they came from the east in some ships, sailed all along that coast, and finding the country very agreeable and fertile, and rich in all kinds of provisions, they settled on the banks of the rivers, and made friendship with the Caribs who then possessed them. Noticing in the course of time that the Caribs were bad neighbours and were wont to eat the other Indians, they were against them, and after long and bloody wars succeeded in driving them out of the rivers and remaining masters of the country, firmly establishing themselves therein.

"At the present day, the Caribs being down and still holding the best and richest lands, they, the Aruacas, are trying to take from them these lands by making war on them.

"And, the Aruacas carry on this war with even greater care and diligence than the Christians have done in their wars against the Moors; for their enmity is much greater.

"Those Indians, on the approach of summer, build a great many ships, forming an "Armada" of thirty or forty schooners, which are small vessels of one mast, capable of carrying thirty to fifty men. They then set out, sailing along the coast, and entering the various rivers in search of "Armadas" of Caribs, who do exactly as the Aruacas.

"When they encounter each other there is a terrible

fight. They also make raids on the villages and murder all the old people, carrying away the young people of both sexes and making slaves of them; they also sell them to other nations with whom they maintain friendship. As a mark of the slavery of those taken in war their hair is cut off—this is considered a great disgrace by the Caribs, who call all such persons priests. The Aruacas say that whenever they meet with young people of both sexes of good habits among the slaves, they marry them to their sons and daughters, who thus become Aruacas; and in this way they have succeeded in advancing the well-being of their people and the territory.

"And, in like manner, the Caribs also treat the Aruacas when they capture them in war. But, as these are cannibals, they devour their captives—the fat and strong coming first, and the lean and poor-looking, when fattened by good feeding and care, are treated in the same way later—at their feasts. And, on this account the Aruacas hate them very much and never cease to revenge themselves upon these savages.

"The Aruaca Indians are tall, well-made, and of good appearance; they curl or make their hair crispy; their ears are very large and pierced: and they usually put pieces of wood or other things in the holes thus made, to make them as large as possible. They are quite naked except that they cover the private parts with palm leaves.

"With the Christians they are extremely friendly, and use every effort to take them to their country. And, in this they have succeeded to a certain extent, for some Christians have gone with them and are well treated.

"On being asked why they like the Christians so

much, and for what purpose they wish them to go to their country, they say it is because the Christians are good friends of theirs, because they wish their help against their enemies the Caribs, and also because they find there is no nation so good as that of the Christians.

"I tried to learn of these Aruaca Indians what their religion was, and also to get some information as to their habits and customs, and for that purpose kept some of them in my own house; for they are accustomed, when visiting this place, to remain among the Christians from one summer to another. This they do, as they say, for the purpose of learning something from the Christians. And, from those whom I have frequently kept in my house, I have understood that their belief and object of adoration is the firmament or heavens, because they say that in the greater heaven there is a powerful lord and a great lady, and that the powerful lord created them and sends them the rain to cause everything to grow on the earth for their benefit and use. And, the Aruacas say that it is good to die, for their souls, which they call *Gaguche*, will go up and live with this powerful lord; also that he who is wicked will have his soul taken away when he dies by *Camurespitan*, which is the name they give to the devil.

"Being asked what it is necessary for the good Aruaca to do in order to be good, they say, he must not kill any other Aruaca, nor withhold his goods from those, who needing help, ask them, but give to those who go to his house, food and lodging; also that they must not take the goods or wives of other Aruacas, but always live in peace and friendship with their neighbours and brothers, the people of their nation. Those who live

thus, when they die their souls will go with *Hubuiri*, as they call the great and powerful lord in heaven.

"These Indians will not permit in their country any lazy or idle people; all such must within three days either work or leave their territories.

"Many other interesting things I also learnt from them, some very strange and so remarkable as to make me wonder very much, but not to cause this my account of these people to be doubted or thought exaggerated, I do not here write, preferring to let all such remain for the present, until in the course of time they become better known and understood.

"These Indians have a meeting-place or school where they assemble as in a manner for preaching. There are among them old and wise men whom they call *Cemetu;* these assemble in the houses designed for their meetings, and there these old men recount the traditions and exploits of their ancestors and great men; and also narrate what those ancestors heard from their forefathers; so that in this manner they remember the most ancient events of their country and people. And, in like manner they recount or preach about events relating to the heavens, sun, moon and stars.

"They are extremely curious. Indeed, I consider that in many respects they are better acquainted with all those phenomena of nature which the Christians hold in so much account than we are. And, in what relates to lightning, comets, and other signs which appear in the heavens, they appear to be very familiar therewith. But it is remarkable that they consider it a great crime among them to study these natural signs during the night.

"These Aruaca Indians have been in commerce and friendship with the Christians of the island of Cubagua for more than twenty-five years, without either being able to understand the other. They traffic with the Christians, exchanging some gewgaws, made from the skins of animals and feathers of parrots and other birds, for articles of little value, after which they return whence they came. They used to call the Christians *Guatraos,* for whenever they met one of us they called out "*Guatrao!*" which in their language signifies a friend.

"In this way, although they have trafficked for a long time with the Christians of all these islands, for lack of understanding their language they have never taken the trouble to learn any of their secrets (*i.e.* anything of general interest concerning them or their country) until in the year 1545, there came with them a Moor who had been living among them for twelve years. This Moor they carried off from the "Armada" of Diego de Ordaz. At the time when this Moor came to the Island of Margarita I was engaged here and interrogated the said Moor, and treated the chiefs very well, with the result that the Moor and the Indians remained among the Christians in all safety and assurance. And, owing to this kind treatment, they have come here every summer and remain in great confidence and friendship with the Christians, bringing with them their wives and children to see the Christians.

"During the time I commanded here I took special care that they were well treated. And, although some Caçiques (of the island) have done them injury, owing to the fact that they were looked upon as enemies by some bad Indians and negroes, as an excuse for depriving

them of the articles they bring on their visits here, they are now held in respect and treated very well. This the Aruacas have now understood, and therefore are not complaining, but know how to look for justice when they are ill-treated.

" From conversations with the Moor and with a boy of the Aruaca nation, I learned all that I have written on this account, as well as many other things which I do not mention for the reasons already given.

" This boy lived with me for two years, and in a short time learnt the Ave Maria and Paternoster. A good number of our vassals used to go and come from their territories (*i.e*, those of the Aruacas) and I profited much by this little messenger in treating with the Chiefs. Sometimes there was great want in the island (Margarita) of provisions, owing to the absence of rain, and I used to send the boy to the Chiefs requesting a supply of their bread (Cazabe), and at the end of a month they would come with two thousand loads of Cacabi *(Sic)*, each load being more than two arrobas, for which I used to give a knife. Thus, they have frequently assisted us, and even at the present day they relieve the hunger of the people in that island. There, it is well known that in their country no want of provision is felt.

" These Indians have many habits common among the Gipsies, particularly their lively and very vivacious temperament, they being extremely sharp and disposed to be most friendly towards Christians; also in trafficking, buying or selling, and in going from country to country for these purposes, they much resemble those people.

" They go out of their territories and make long voy-

ages in their boats, of more than two hundred leagues to the east and west, along the coasts or by means of the rivers of these parts, many of which they ascend. They sail or go wherever they like, as people who have no fear or dread of any other Indian nation. They give accounts of rich countries abounding in all kinds of fruits, and very fertile, which they have seen in their travels, and of Caribs who are always engaged in war and kidnapping other Indians; also of certain pearl islands, the Caçiques of which are my friends and took me to visit them.

"With regard to these islands I was on the route to visit them, with good and necessary preparation for the venture, but the poison of envy was so strong among some Spaniards so that owing to their bad and scandalous reports, they caused me to abandon the whole business. From this much injury resulted to themselves, and the secrets remain undiscovered."

Mr. REDDAN, who kindly furnished us with the above translation, states that the paper is in a wretched condition, being much blotted, and therefore difficult to read. He does not therefore vouch for the absolute correctness of the copy. Following the paper, signed by RODRIGO DE NAVARRETE, Notary of his Majesty, come the following notes, probably by the same writer:—

"*Aruacas.* An Indian nation which inhabits the entire coast from the Gulf of Paria to the River Marañon. They are a people of good condition, and well disposed towards the Christians. The country where they reside is flat and level with the sea, being nearly all inundated in the winter (rainy) season. The people are very numerous.

Trinidad. Trinidad is a large island of a quadrangular form. It is well populated, chiefly by two Indian nations, the one being Carib, the other Aruacas. The land is good and the soil fertile; there are many healthy places and rivers with good waters.

"*River Orinoco or Huyapari.* The river Orinoco is large and it is said has its source in the territories of Quayena, (Guiana) and from information received from the Aruacas, the Province of Quayena is good territory and populated with native Indians who are very good people.

"*Rio de Amana.* The river Amana is a river from which the Carib Indians have their origin; they are very prejudicial in the districts about the "Sierras" of Amana and of Ticios (?)

Other notes refer to places along the coast, but as they are not concerned with Guiana we leave them out. As may be seen the amount of knowledge possessed by the Spaniards in regard to this country was very little, considering that it had been discovered about fifty years. Spanish adventurers must have visited the different rivers, but nothing of the nature of a settlement had yet been thought of. But, even at that early date the English and Flemings had already commenced trading along the coast. When SERPA left his colonists at Cumanà in 1569 he instructed them to maintain and defend the city from enemies and Lutherans, who came regularly to that port. The following account of SERPA'S government is taken from an undated manuscript in the "Archivos de Indias," probably written about 1580:—

"The Government of SERPA, New Andalusia as it is called, and in the language of the Indians, Guiana, con-

formable to the limits that were assigned it, is from the island of Margarita to the river Marañon, three hundred leagues to the east, and inland as many north and south. In this extent of territory are included the Omaguas and Omeguas Indians; the Provinces of the Dorado towards the south, trending in the direction of the coast; the province of Maracapana in the limits of Venezuela, which was formerly occupied; the mouths of the Santa Fè, in which district Morro and the Indians called Perito, some twenty leagues inland, are situated, and through which the limits of the government of Venezuela pass; and also the Indians called Palenques, so named from the stockades within which they are wont to fortify themselves. And, in like manner, the province of Cumana, north and south, with Margarita, where there is a village of Spaniards called "Nueva Cordoba," with very few inhabitants. And from Trinidad to the mouth of the river Amazons, which to the east is about two hundred leagues, where the province of Amacas (Aruacas?) is situated, part of whom are Caribs, and all very warlike; they are neither peaceful nor conquered.

"Then, from the Gulf of Paria and the Dragon's Mouth near Trinidad, and "Punta del Gallo" or "Anegado" to the south of Trinidad, and the River of Paria to the Orinoco, and other rivers, ports, capes, and parts of the Province of Amacas, *of which no mention is made as they are not known.*

"The immense river called the Amazons, and also known by the other name of Orellaña, falls within this government. It is said that this river has its source in a place called Cazes (?) in the Peruvian Andes, and has a course of more than fifteen hundred leagues, flowing

through countries thickly populated with Indians, of which but little is known or discovered; and finally pours its immense volume of water into the sea near the Equinoctial Line. Its mouth is fifty leagues broad, and in the first five hundred leagues of its ascending course there is a number of largely populated islands.

"About eighty or a hundred leagues to the east of the Amazons is the River Marañon* which passes through nearly all the boundaries through which the line of demarcation is drawn. This is also a very large river of great volume, its mouth being fifteen or more leagues wide, and its currents flow from the Equator and provinces of Brazil."

It will be seen from this, that although so little was known of Guiana it came within SERPA'S government. When the boundary commission to define the limits of the Spanish and Portuguese territories reported, its President gave the names of several Spaniards who had passed along the coast, and stated that they never made any settlements whatever, simply contenting themselves with taking possession in the name of the Sovereign. The consequence was that the Dutch, English and French, founded colonies without any opposition on the part of Spain.

Coming down to RALEGH'S time, it may be stated that nothing was certainly known of Guiana. Spain kept her own council and took care not to publish even what little she knew. RALEGH was therefore forced to pick up his information from various sources, mainly from Spanish letters and also from the Dutch and English

* The writer seems not to have been aware that this is only another name for the River Amazons.

traders who had been in these parts. It must be remembered also that he spent some years in the Netherlands, and had opportunities of hearing what the Dutch Skippers had to say about the "Wild Coast." The English when they captured a Spaniard always took care of the letters they found, in fact they were so particular in searching for these that the Spanish authorities gave orders for them to be packed in such a manner as to be easily thrown overboard when the vessel was in danger. It followed therefore that what could be discovered in this way become known to the English voyagers. Then, in the year 1594, ROBERT DUDLEY was in Trinidad, where he met Captain POPHAM, who had learnt something of Guiana from a Captain HARPER who had been prisoner to the Spaniards in the Canary Islands. DUDLEY'S account is given by HAKLUYT and is interesting as the first English report on these countries. This was probably seen by RALEGH and supplemented the information he had gleaned from other sources.

Of RALEGH'S own voyage we have little to say as it has been published in so many forms. In the sense of a revealing of the country it certainly deserves the title of "The Discovery of Guiana," and, together with KEYMIS' and BERRIE'S reports of the second and third voyages, may be favourably compared with what we have been able to glean from the Spanish archives.

In a paper among the Spanish Archives, dated from Cumana April 18th, 1596, we find DON ROQUE DE MONTES', (Royal Treasurer of Cumana), account of RALEGH'S expedition. He had sent Captain PHELIPE DE SANTIAGO up the Orinoco to seize the two Englishmen

left there by *Guat-erral* (RALEGH), but only found one of them, Francisco Espari, (FRANCIS SPARREY) for the other (HUGH GODWIN) had been devoured by a tiger. SPARREY declared that *Guat-erral* was to return in March of that year, and that the Indians were expecting him. The writer says, "but as he left here, last year, much crest-fallen on account of the victory *(sic)* we gained over him, I hope in Our Lord he may be stopped from carrying out his nefarious plans." In another part of the paper he states that the province of Guiana suffered greatly from the want of Spaniards to populate it. "The difficulty of protecting ourselves from the numerous enemies who frequent these coasts, *Flamencos* and English, but particularly *Guat-erral*, who left here somewhat irritated against us, makes our position in all these territories very unsafe; and, unless Your Majesty do something for us we shall soon be placed in the greatest danger."

The same writer said (Decr. 30th, 1597) that "they are surrounded by English pirates and Dutch Lutherans, rebels of your Majesty, and unless speedy succour arrives they will have to evacuate all these places, for they are by no means able to protect themselves against such numerous and savage enemies."

HAKLUYT, writing in 1584, said that "all that parte of America eastwarde from Cumana unto the River of St. Augustine in Bresill, conteyneth in lengthe alongest to the sea side xxj C (2,100) miles, in whiche compasse and tracke there is neither Spaniarde, Portingale, nor any Christian man, but onely the Caribes, Indians and saluages. In which places is great plentie of golde, perle, and precious stones." He argues against the right

of Spain to such large territories when she had no power of control over them, and advises the English to go over and take a share. "When we shall have looked and narrowly pried into the Spanishe forces in America, wee shalbe doubtless ashamed of ourselves, that we have all this while bene afraied of those dissemblinge and feeble scarr crowes."

Spain might protest as much as she liked, but it was quite useless if a possession were worth retaining. She disputed every inch of territory at the beginning but her protests generally begun and ended with words. Virginia was a striking example of this as was also Guiana. In the Islands however her fears led to some sort of action, with the result that the settlers were driven out of St. Christophers and Tortuga. But, it was only for a time, they returned again in greater force and held their own. The Dutch, English and French laughed at the claim to the whole continent, and yet our Venezuelan neighbours of to-day actually ground their demand for the River Essequebo as a boundary on such a shaky foundation. Spain made a great show with her "Invincible Armada," and her squadrons of treasure ships, but when it came to fighting that was another matter. She hated the English and French rovers and was ready to treat them with the utmost cruelty if they fell into her hands. Yet, at the same time the threat of retaliation by a buccaneer was sometimes enough to deter the authorities in the West Indies from going to extremes. It was another case of the "dog in the manger;" the territory was all hers, whether she could occupy it or not. It followed therefore that when the Dutch took possession of Guiana they were looked

upon as interlopers—squatters on the territory of the King of Spain. The Government of New Andalusia or Guyana extended to Cayenne, notwithstanding the fact that the coast between the Orinoco and the Amazon had been granted by the Sovereigns of other nations, and had been the scene of disputes and battles for its possession entirely apart from its so-called owner. It is not long since the Sovereigns of the United Kingdom dropped the absurd title of "King of France"—in that case every one saw the absurdity, yet the authorities in Venezuela cannot or will not see how utterly preposterous is their claim to the whole of the old colony of Essequebo.

*The First English Colony in Guiana.**

THE one and twentieth of March, 1604, Captain CHARLES LEIGH in the *Olive Plant*, a proper Barke of some fiftie Tunnes, accompanied with six and fortie men and boyes, departed from Wolwich with intention to discover and inhabit some part of the Countrie of Guiana, where he had beene in a former voyage: they stayed in the Downes untill the eight and twentieth of the said month, and passing thence they touched in the Ile of Mogador on the coast of Barbarie in the month of Aprill, where we stayed about some five dayes, and watered on the Mayne land in despite of the rebell Moores, which would have had money for our watering. Thence with prosperous winde coasting the Iles of Cape Verde, we passed over to the West Indies, and upon the tenth of May comming in change of water, which showed thicke and white, by the next day we were in fresh water, and the next day following about five in the morning we saw two Ilands in the mouth of the River of Amazones, making account that we were fortie leagues up the River, and came to an anchor in three fathoms under them, which we found low land covered with high trees. Then the Captain with some eight of the best men of the ship went toward the shoare, and finding many Indians comming toward them they returned aboard, and found the ship almost aground, but sounding the Bay brought their ship into the Channell which they found very narrow.

* "Captaine Charles Leigh, his voyage to Guiana and plantation there." *Purchas, his Pilgrimes, Vol. iv., Chap. xii.*

Within awhile after foure Indians in a small canoa shewed themselves unto us, to whom we sent our boat with some of our commodities, as hatchets, knives, glasses, beads: they had nothing but Maiz and small blue-headed Parrots, for which we gave them some of our triffles. Not long after another canoa comming out, our boat clapt between them and the shoare to take some of them, to learne the state of the River by them, but they freed themselves all save one youth, which was brought aboard, which next day after escaped, leaping into the sea twelve leagues as we judged from land. Thus we took our leave of the River of Amazones, and having uncertaine shoaldings all the way in our way, about ten a clocke in the night wee strooke upon a sand before wee could let fall our anchor, where wee beat off a piece of our false keele, before we could get off. Being gotten off, we came to an anchor in four fathom and a halfe water, and rode there untill the next morning, where wee descryed the land sixe leagues from us with the entrance of a River.

The two and twentieth of May wee arrived in the River of Wiapojo*, in the latitude of three degrees and a halfe to the North of the Line, where wee found the people readie to give us the best entertainment they could, bringing us Hony, Pines, Plantons, Potatoes, Cassavi (whereof they make their bread and wine) Fish of many sorts, Hennes, Conies, Hogs, and such like. This day he took an oath of all his people to be true to him as long as he abode in the countrie. Then after divers conferences with the chief Indians, and namely with two of their countrie which had been before in England, and

* The Oyapok, a river in French Guiana.

could speak some English, he found them very willing to have him and his people abide in their countrie; who pretending want of many necessaries, whereof indeed he stood in need, and especially of victuals, hee went up the River in his Boat with some fourteen men to take perfect view of a fit place to inhabit in, and to sound the depth of the River as they went. At his returne he caused his ship to be brought up hard unto the falls of the River; but after they had stayed there one day, finding sundrie inconveniences, they came back againe to their first road; with a determination to plant and seate themselves upon the first Mount or high ground, at the entrance of the North side of the River. But the Tayos and Supayos seeing him and his company come downe the River againe, entreated him earnestly to stay among them, offering him their owne dwelling houses and gardens alreadie planted to their hands, whereof he accepted: to wit, of two houses and of as many gardens as they thought convenient to serve his turne, with condition that he should ayde and defend them against their enemies, the Caribs and others. Hereupon they made a great feast, desiring our Captaine to bee at it, and they demand of their generaltie of the staying of our men in the countrey or no. Whereunto they gave their free consent, and desired him withall to send into England for men to teach them to pray. This done, the next day he brought all his furniture on shoare, and bestowed it in the aforesaid houses. And for the better assurance of the performance of the salvages promise, he demanded pledges of them to be sent into England, whereunto they willingly condescended, which were in number five, whereof two were of good account. Hee

retayned thirtie five Englishmen and Boyes with him, sending the rest home in June, with the five Salvages which were plentifully furnished with their country victuals, with Letters to the Right Worshipfull Sir OLAVE LEIGH, his brother, of his successe and desire to supply his wants, which he most kindly twice supplied to his great charge, within short time after.

The Caribs in eight warlike canowes came to surprize them as farre as the Mount Comaribo; whereof the Indians being advertised by our fishers, desired Captaine LEIGH to aide them, which he did with some foure and twentie men in eight canowes. But the bateell being begun, after they had heard the sound of our Trumpet and Musket, they fled to sea-ward, our canowes chasing them; but the enemy being swifter escaped with casting of one of their canowes, which are able to carry twentie men and victuals for ten days, which canowe they brought home.

Within a sennight after our Captaines returne, hee made a voyage in an Indian canowe having Indians to rowe him, accompanied only with THOMAS RICHARDSON, his Refiner of Metals, and JOHN BURT his Chirurgion, 90 miles by water up the River of Aracawa, to a Nation called the Maurauna, where he traded for Tobacco and Cotton yarne, and Cotton-wooll. There he left his Chirurgion being sicke, and with his Refiner and three Indians (whereof one WILLIAM was his Interpretor) went up to a Nation called Marraiai the space of thirtie miles, where they passed through a goodly Plaine foure miles broad of much stonie ground, wherein they saw Deere. At length meeting with the people, they were kindly entertayned and fed with such as they had; as

dried Tygres flesh, dried Hogges flesh, and small fish. Then after some discourse, they enquired for gold, shewing a Ring. An old man spake unto him and pointed up into the Countrey, and the Captaine asking the Interpreter what he said, he told him that he said there was no such that way. The Captaine perceiving the falsehood of his Interpreter would goe no further, and so returned home, where he found us for the most part sicke, and the Indians not so kind unto us as they had promised; which he marvelled and grieved at.

Within three days after his returne, his shipwright RICHARD HOWARD died before hee could make an end of his shallop. And in September our Captaine himselfe began to droope, partly of griefe to see the weake estate of his people, and the ill performance of the Indians promises; yet neverthelesse he ceased not to take order for the Indians bringing in of victuals and such merchandize as could be gotten, as Waxe, fine white long Feathers, Tobacco, Parrots, Monkeyes, greene and blacke, Cotton-yarne, and Cotton-wooll, sweet Gummes, red Pepper, Vrapo and Apriepo woods, Spleene stones, Matiate stones, Roots and Berries, which we thought to be medicinable, Anato a Berrie or Cod, such as the Indians paint themselves red withall mingled with Oyle: Vrapo which is the heavie wood whereof they make their Swords and Bowes, Apriepo, a wood that the Frenchmen and Hollanders fetch away: a wood which they call Ayari, which they kill fish withall.

The fishers beate this wood with another piece of wood, till it shivers into flakes, which smelleth exceeding strong like Garlicke, wherewith in sundry places of the Creekes going in according to the depth of the water,

they beate it up and downe often in the River, which the fish tasting are intoxicated, and so distempered withall, that they flote and tumble upon the upper part of the water, and then with Bats and Poles they knocke them on the heads. Their bread they make of Cass-ava, a white Roote commonly a span long, and almost so thicke, which the women grate in an earthen panne against certaine grates of stone, and grate three or foure busshels in a day. The juice thereof they crush out most carefully being ranke poyson raw, in a hose of withe, which they hang up upon an hooke, and afterward with a weightie logge which they hang at the other end they squeeze out the water into an earthen pan or piece of a Gourd, and then seethe the same juice with their red Pepper whereby it becommeth holesome, and if they will have it sweete, they will seethe it but ordinary, if they will have it sower, they will seethe it extraordinarily, and use it in manner of sawce, and when they be sicke, they eat the same and bread only. The women also make drinke of this Cass-ava bread which in their Language they call Arep-apa, by baking of it blacke, dry, and thinne, then chewing it in their mouthes, they put it into earthen pots narrow in the bottome and broad above, contayning some a Firkin, some a Kilderkin, some a Barrell, set in a small hole in the ground, with fire about them. Being well sod, they put it out into great jarres of earth with narrow neckes, and there it will worke a day and a night, and keepe it foure or five dayes till it be stale, and then gathering together an hundred and more, they give themselves to piping, dancing and drinking. They make drinke also of Cass-ava unchewed, which is small and ordinary in their

houses. They use also to make drinke of Potatoes which they paire and stampe in a Morter being sod, then putting water to it, drinke it.

Before and after the sicknesse of our Captaine, many of our men fell sicke, some of agues, some of fluxes, some of giddinesse in their heads, whereby they would often fall downe; which grew chiefly of the excessive heate of the Sunne in the day, and of the extreame damp of the earth, which would so moysten our Hamackas, or Cotton beds, wherein wee lay a yard from the ground, that we were faine to imitate the Indians in making fires on both sides under them. And for all that we could doe, some nine of our Company were dead before our ships arrivall. Besides we were mightily vexed with a kinde of worme, which at first was like to a flea, and would creepe into the feet especially, and under the nayles, and would exceedingly torment us, the time it was in, and more in the pulling out with a pinne or needle, if they were few. But one of our men having his feete over-growne with them, for want of hose and shooes, was faine to submit himselfe to the Indians care, who tying one of his legges first with his feete upward, powred hot melted wax which is blacke upon it, and letting it lye upon it till it was thoroughly cold, they forcibly pulled it off; and therewithall the wormes came out sticking in the same, seven or eight hundred in number. This man was named JOHN NETTLETON, a Dier of London, which afterward was drowned.

In the middest of all these extremities our Captaine's Interpreter which hee had threatened for his false demeanour in his voyage to the Marraias before mentioned,

gave counsell to his Master named AUACCAURI, an ancient Captaine among them, to make a motion among the Indians at their next meeting to say, it is the best way for us now to make an end of them while they are sicke, either by starving or otherwise. For when the ship commeth, hee will kill us for keeping him without victuals now. This motion being made at their meeting, which was in CARISAVA his house, and among his and MARTIN'S kindred, (which then remayned pledges for our men's safetie in England), their wives hearing the Interpretor's Master AUACCAURI broaching this matter ranne furiously upon him and tare his clothes such as he wore from him, and mightily beate him, the other of their kindred, keeping those Indians off from the women, which would have taken his part.

Some of our owne men lying at the nexte house where this was done, inquired of an Indian which owed this AUACCAURI a grudge, what the cause was of the said tumult; who imparted the whole truth unto them. Our men comming suddenly to the Captaine, acquainted him with the whole matter; who suddenly bethought himselfe and sent for all his men that were neere him; and for EPERIAGO and PLUAINMA an Indian, that had been in England; which were two of the chiefest, and caused him to send for his trayterous Interpretor, which came bringing Hens, drinks, and bread. Assoone as he came, shewing what hee had heard, requiring them to declare what wrong he had done them. Who answered, none. Then said he, this fellow, meaning the Interpretor, hath sought my life; and therewith commanded his men to bind him hand and foot, which done, he dismissed them, desiring them to returne the next morning. In the mean

time he caused his Prisoner to send for a Canowe to fetch three of his men, which were up in the River, who immediately did so. Now having all his men together, hee caused them to have all their Furniture readie. Appointing one WILLIAM BLAKE to see the same diligently fulfilled, the watch carefully to be kept in the night, and two to ward at the doores all day with their Furniture, to take the Indians weapons out of their hands at their comming in at the doore.

This being ordayned, the Indians came the nexte day, to whome the Captaine said, in regard that I have beene so carefull to punish the wrongs done unto you, I would have you readie to revenge the wrongs done unto mee, who seemed very unwilling to do any farther Justice, esteeming his binding a sufficient punishment. At which the Captaine beeing very much vexed, commanded the two foresaid Indian Captaines to depart, charging them to send him in fish and other victuals for his Company. In the meane time he and the chiefe of his men, consulting what course to take with the Malefactor, they thought it best that hee should lye so bound untill the next day being the third of his bondage, and to send for the chiefe of the Indians, and upon confession of his fault, craving pardon thereof, to be dismissed before them.

Captaine Charles Leigh's letter to Sir Olave Leigh, his Brother.

"Most loving Brother,—I did write unto you from Muggador, where I stayed untill the nineteenth of Aprill, and on the fourteenth of May, I had first sight of Guiana, in the mouth of the River Amazones. The two and twentieth, I arrived (praysed be God) in safetie in the

River Caroleigh, heretofore called Wyapoco, and the same day, I tooke possession of the Countrey in sight of the Indians. The Indians which doe inhabit this River are about one thousand, five hundred men, women and children, and they are of three nations, viz., Yaioas, Arwarkas and Sapayoas, which being chased from other Rivers by the Caribs, have combined themselves together in this place for their better defence, and are now at deadly warres with the Caribes. After that I had stored my selfe with Bread and Roots sufficient until the earth with God's providence might yield me supply, I did then send for the Chiefe Captaines of the Yayoas aboard, whom with gifts and good usage, I easily entreated to stay aboord my ship untill such time as by his meanes I was provided with all kinds of Plants, which their Gardens doe affoord, yet all this while he knew not my purpose. The day before I purposed to make my intent knowne there came another Chiefe Captaine of the Yayoas aboord to dine with me, who together with the former after Dinner desired to speake with me, whereupon I sent for an Indian who had beene in England, to bee Interpretor, and tooke them into my Cabbin. The two Captaines told a long Storie of the wrongs the Caribs had done them, how they had driven them from their ancient dwellings in other Rivers, killed many of their friends, carried their women and children away Captives, and hurt many of their men; and thereupon they called one of their men to shew me how he was lately hurt in three places with their Arrowes; to conclude, they told me, how they purposed the nexte Moone to goe against the Caribes, with twentie Canoas, and earnestly entreated me if I stayed so long to goe with them to their Warres.

Upon this good occasion, I told them that I purposed to stay in the Countrey, seven or eight moneths, to seeke out and make triall of Mynes. And in the meane time that I purposed to build Houses ashoare at the head of the River, and there to plant Gardens, that my men might have victuals of their owne labours; which done, I would build a shallop and send twentie men in her with them to fight against the Caribes. With all this they seemed wonderfull well content, and thereupon they promised Indians to helpe mee to build and to plant, and the Chiefe Captaine promised himselfe to goe up with me. The next day being the third of May, I set sayle from the mouth of Caroleigh, and cast Anchor in a Bay under Mount Oliphe, where I purposed to plant, and make my habitation: but my men discomforted with the sight of the Woods which they were to fell, grew discontented, and omitted no practices to overthrow the voyage, being suborned under hand, by my unfaithfull Servant, the Master, his lewd Consorts he brought with him, being the only publike maintayners of the Muteine. How I have beene troubled with him and his Consorts, (who intending spoyle and purchase in the West Indies) have from the beginning sought the overthrow of this voyage, this Bearer can certifie you at large. And undoubtedly hee made full account with his head strong companions at such a time to have commanded the ship at his pleasure. To conclude, amongst other their practices, they so consumed the victuals which should have mayntained us untill the earth had yeelded supply, as that in sixe dayes, our Potatoes, which should have lasted us two moneths, were wholly spent. Here upon being farre distant from the Indians, who inhabit at

the mouth of the River, fortie miles from the falls, and it being very doubtfull, how wee should be furnished with victuals from them in our extremitie, I gave consent that the ship should returne to the mouth of the River, with this condition: that after I had refurnished them with victuals and other things sufficient, that then they should plant upon Mount Huntley, two leagues to the west of Caroleigh: which being neere the Indians, and betweene them and their enemies, they would be readie and willing to furnish us with victuals, upon any extremitie: to which condition they generally consented, that place being first motioned by some of them. The Shippe being returned, they had then brought mutinie to such a head, as that to my face, they stood in defiance of the voyage, and told me plainly they would not stay, doe what I would or could. I urged them with their promise to plant on Mount Huntley, one of them who seemed most forward of all men to yield to that motion: answered that he promised in policie, to draw me from Mount Oliphe. But in the end it pleased God, what by faire meanes and what by foule, I brought them all to consent to stay one whole yeere, thorow all extremities, if it were possible to make a full triall both of people and Countrey, and to plant upon Mount Huntley, according to their promise. This agreed upon, I went ashoare to the Indians, to provide victuals, and other necess-aries for our Plantation, who being exceeding glad of my returne; offered me to choose the best of their houses and gardens, to dwell amongst them. For they were very unwilling that I should goe to any other place: to conclude, judging their offers by many likelihoods, to be without deceit, I resolved to abide with them upon this

condition: that they should send foure principall Indians for England as pledges, for our safetie with them; whereunto they willingly condescended, and if I would, I might have twentie. For they make daily suite to me to goe for England. Beeing in Conference with an Assembly of two or three hundred, purposely met to crave my abode amongst them, and demanding of them vowes and protestations, according to the custome of all people, for the more securitie of our peace and amity: their answere was that they knew not how to make vowes and protestations and therefore generally they desired (sundry of their Captaines speaking it together, with a low and humble voice) that I would bring them men to teach them to pray. Which motion of theirs, proceeding from themselves and in that humble manner, strooke me I assure you into an admiration of joy, to think that it hath pleased Almightie God after so many dangers heretofore, and troubles in the voyage, to preserve me to be a meanes to this simple-hearted people of the knowledge of Christ. Undoubtedly, it was the wonderfull worke of God's Spirit in them, whereat all Christian hearts ought to rejoyce. And I am perswaded, the like instance hath never beene before by any people in the World: I beseech Almightie God to give a blessed end to this hopefull beginning.

The foureteenth .. June, concluding with the Indians upon sundry conditions, I purchased of them the same day for a few Hatchets, Houses and Gardens planted with Cassava, and Potatoes sufficient for all my Company: the situation of our Houses is in the pleasantest and most fruitfull place of all their habitations. And because it is a small village of six or seven houses; and

the first place of our settled aboade, I have named it Principium: the Hill on which it standeth being part of the Mountaine on the West side of the entrance of the River, I have named Mount Howard, to honour the remembrance of my Lord Admirall, of whom heretofore I have received many favours: On the East side of the entrance of Caroleigh, lieth the River Oliveleighe heretofore called Arrikowarye: And on the West side of Mount Howard runneth the River Iotrameleighe, by the Indians called Wanarie. The Commodities which this Countrie doth yeelde, and through industrie will abound in, are these; Sugar-Canes, Cotten and fine Flaxe; also it would yeelde great store of long Pepper, if there might be vent for it in England: here is sundry sorts of Gummes, of Woods, and of Dies, which I hope will prove good commodities, of all which I have sent you samples by Master HUNTLIE, especially one sort of Gumme, which I am perswaded will prove very rich. Also I have sent unto you a piece of a Stone taken out of a Mannate or Sea Cowe. I am given to understand that a little thereof beaten into powder, and drunke in Wine or Ale, will in a few houres cure any man that is troubled with the Stone, they say it dissolveth it instantly. I doubt not but to get a dosen of them before this time twelve moneths: my refiner hath made triall of sundrie Minerals, but cannot yet finde any Mettals. At my Arrivall here I found a Dutch Shippe, and sithence here hath arrived another, they buye up all the Flaxe they can get, and pay so deere that I can get none; they have not gotten so little I think as ten tunnes of Flaxe within these two moneths. I doubt not but I shall be able to returne a Shippe laden with Flaxe and other

commodities the next yeare; the Flaxe yeeldeth a wonderfull encrease, and will grow anywhere, but especially in low moorish grounds; the Indians report that the Roote yeeldeth increase every moneth, and everie yeelde may be some foure ounces, by this accompt an acre of ground planted with these rootes, and distant three foote a sunder, will yeelde 17,280 li. everie yeare, which amounteth at six pence the pound to 432 li. I doubt this will not prove answerable to their reports, but I verily beleeve it will yeelde halfe the encrease they speake of. The Dutch men have reported that it is worth in Holland sixeteene pence the pound, which I rather beleeve, for my wevers tell me that they will warrant it to dresse exceeding well, and then it must needes be excellent fine grounds for any stuffe; for Cotten here is little, not worth the speaking of, yet the Countrie will yeelde abundance, and in sixe weekes the seede will yeelde Cotten, and it beareth continually and plentifully. I pray you sir send me more weavers, for I know not how to get any thing spunne for them, for the women here are put to that extreame labour, that they have no time to spinne, for they only fetch water, cut wood to burne, and bring it home upon their backes, they gather all their roots and bring them out of their Gardens, they make all their Bread which is verie labour-some, they dresse all the victuals, make all the drinke, attend upon the men while they are at meate, and besides, they dresse up their houses in their kinde, and nurse their owne children: So as they are alwayes toiled with labour, and have little or no time to spinne. For Sugar Canes the world doth not yeelde better soyle for their encrease, and whereas in Barbarie it is fifteene or sixteene moneths before they

come to perfection, here they grow up in ten moneths. And in Barbarie they are planted onely in two Vallies, where they are watered every weeke, but here they grow upon the mountaines, and never watered but with raine onely. A few yeares I doubt not will afford plentie of Sugars, if wee shall have meanes to make them. My loose commodities, as Hatchets, Beades, Knives, Looking-glasses, etc., are almost all gone; a great part in buying of victuals, but the most part to stoppe the mouthes of my Mutinors, and monstrous Sailours; to whom also I have promised two third parts of my Iron.

Now for the prosecuting of this voyage, in such sort as that we be not prevented by the Spaniard nor any other Nation; I would entreate you with as much speede as possibly you can to send me a supply of one hundred men at least, to abide here, all labouring men and gardners, for such are the fittest here for a time, with a few Carpenters; and with them three or foure good peeces of Ordnance with shot and powder: Also fiftie Calivers for the men that stay here: if you can send these men in two Shippes, I doubt not but to lade one of them backe in three moneths after arrivall, and the other which I wish may be the Olive plant, I would keepe here and fit her for a Frigot to keepe and command the River. I have written to my brother JOHN LEIGHE to deliver unto you such monies as he hath received of GIFFORD, who I hope hath ere this time paid his debts. I hope you shall get store of voluntarie men to ease the charge of the voyage, and looke what you shall disburse in my behalfe for the accomplishment of the voyage, I will, God willing, see you honestly paid with advantage; or else if it please you to put it in Adventure, it shall be accomplished

in any sort to your owne desire. As I doubt not of your love and forwardnesse, especially in so good an action, so also I make no question, but this Countrie will in few years yeelde you satisfaction beyond your expectation. If my wife have not alreadie attained her suite of the King's Maiestie, I hope she will the sooner speede upon this newes, which if she doe, my desire is, that all shall be imployed upon these proceedings; and to that effect I have written to her. I have written a Letter to the King's Maiestie; another to the Lords of the Counsell, and one to my Lord Admirall.

The bearer hereof, Captaine HUNTLIE, is the worthiest young Gentleman that ever went to sea, upon any dangerous enterprize, he was never dismaid, neither with extreame dangers at Sea, nor with all the Mutinirs aboord, which had been able to have discouraged an old experienced Souldier; besides, I found him alwaies a most true, faithfull, and loyall friend, and therefore I pray accompt him for a right honest man. I have made him my Lieftenant-generall of these Countries during life, and therefore I pray let him returne Chief Commander in the first supply. I would pray you also to procure to come with him some honest and discreete men whom I might relie upon as trustie friends, and use as companions both for advise and societie, for I am now very uncomfortably matched, having no worldly strength to trust upon but my selfe onely. I have sent unto you foure Indians, principall men in their Countrie, which were delivered unto me as pledges of our safeties here, and they are to returne again the first, but I thinke some of them will be more willing to stay longer. The English man which was left here by Captaine LEA, is

dead, I pray you procure Sir WALTER RAWLEIGHES Indian or my Lord Admirals, for I want an Interpretor exceedingly, here is but one, and he understandeth but little to any purpose. I pray forget not to send Preachers, sober and discreete men, and such as are well perswaded of the Church government in England, etc.

From Principium, or Mount Howard this second of July 1604.

(The Relation of Master John Wilson of Wansteed in Essex, one of the last ten that returned into England from Wiapoco in Guiana 1606.)*

Captaine CHARLES LEIGH and his Brother Sir OLAVE LEIGH, did furnish to Sea the good ship called the *Phenix* with commodities for the Countrey of Guiana; and necessaries for the voyage, with fiftie persons to inhabit Wiapoco, of sundry Trades, who directing their course towards Wiapoco, on the Coast of Guiana, which the Spaniards call the River of Canoas, arrived on the twentieth of May following, where he found a ship of Amsterdam, trading with the Indians. They perswaded the Indians, that our nation came to inhabit among them, only to oppresse them as the Spaniards doe in other parts of the Indies, which they themselves confessed unto Captaine LEIGH, notwithstanding they offered our Nation no unkindnesse, but used them in all the kind manner they could. For they provided whatsoever our Company wanted which they could get them. In so much the Gentleman was like to have done right wel, if it had not happened that his Company had not mutined, which did partly arise because of the climate, which is much hotter than ours. And for that they were unprovided of

* Chap. xiiii.

victuals or other necessaries, therefore constrained to live in such manner as the Indians themselves doe; for that they did see at their landing only Mountaynes and Hills covered with Woods. And for the most part of them had beene housholders in England, not accustomed unto such a strange Countrey or Nation, nor such a diet, for which causes they were so much discontented, that they cried to their Captaine, home, home. Thus the Captaine and his whole Company was discontented, and also the Master of his ship called MARTIN PRINX, who shipped himselfe shortly after their arrivall in the Amsterdamer, which they found there, whereupon the Captaine placed his Mate RICHARD PETS of Weymouth, to bee Master of the *Phenix*, furnishing him with such victuals as the Countrey afforded, as Cassavi for their bread, and Potatoe Roots, with fish, water, and such provision as they had of their owne aboord, appointing EDWARD HUNTLEY to be their Captaine, to goe for England, who departed from Wiapoco about the first of July 1605, by whom Captaine LEIGH advertized his Brother Sir OLAVE LEIGH. After whose arrivall Sir OLAVE LEIGH, hee with all speed furnished the aforesaid ship, called the *Phenix* to Sea, with Commodities for the Countrey and other necessaries, with thirtie men of sundry Trades, appointing the aforenamed RICHARD PETS to be Master, and EDWARD HUNTLEY to bee Captaine, they departed from Woollage, one the———towards Wiapoco, who arrived at their Port one the fifteenth of January following, who expected with the rest of their Company aboord, to have found the Generall and his Company on Land, to have beene in farre better case then they were, for that they found them for the most

part extreame sicke, and some of them dead : and presently after their arrivall three or foure men of them died, and the Generall himselfe was very weake and much changed, which partly proceeded by reason of their great want of victuals, for that the Indians could not at all times provide them that they wanted. And chiefly for that the Company were perswaded that the ship would never have returned unto them againe, which plainly appeared amongst them, for that at the arrivall of our ship, some of them which had not in three monethes time beene a stones cast from their houses, came aboord of us, a mile and more from their houses in weake estate, which caused very much discontent amongst our fresh water Souldiers aboord, and they were the more discontented, because they could not advertize them of any Commodities the Country yeelded which would afford them present benefit, insomuch that they wished themselves in England again. During which parley, our Generall came not aboord of us, for that he was at his house called Mount Howard, a mile and more up into the Land, which stood on a hil very pleasantly situated, but according to the Countrey Manner, by reason that their enemies should not wel find their houses nor suddenly assault them, have therefore very rough passages unto them, invironed all with Mountaines, Woods, and Hils. Wherefore the Generall sent one SIDNEY HARRINGTON unto Captaine HUNTLEY, M. TEDERINGTON, Preacher, and to the Master of the ship, to land their Company in Possession Bay, a place which the Indians gave unto our Generall, and therefore by him so named.

At whose landing according unto the Generall his

Commission, they were all sworne unto certaine Articles, as that they should acknowledge Captaine CHARLES LEIGH to bee their chiefe Generall of Guiana, under King JAMES our King of Great Britaine, and that they should not be hurtfull unto the said Generall his proceedings, but to ayde and assist him to their uttermost powers. Which being effected, our Generall came unto us, and after kinde salutations, having taken order for our Lodgings, for that time hee departed from us. The Indians in like manner after their Countrey fashons kindly entertained us, and after further Conference had with our Generall, hee related at large unto us what had happened unto him and his Company in their absence; that by reason of his Company their discontent and sicknesse, they had not travelled up into the Mayne Land; and therefore of his owne knowledge hee could not certifie them of any other Commoditie the Countrey did yeeld, then such as hee knew of before their departure, but the Indians had informed them, that there was up in the Mayne very rich Commodities, as also Gold, and Silver, and especially in the River of Caliane, where the Caribes inhabit, who are enemies unto our Indians of Wiapoco, and so called by them. Upon which information our Generall thought it would have beene best to have peaceable traded with the Caribes: But our Company misliked thereof, insomuch that the Generall altered his determination, and agreed to joyne with their friend Indians against the Caribes their enemies. Whereof having advertized the chiefest of them, they most kindly embraced their offer, presently made eight of their Canoas in a readinesse, furnishing them with Bread and Drinke, and Victuals, which for the most part are

Crabbes and Fish, with some hundred of themselves all naked in their Canoas, whome our Generall accompanied with some eight and thirtie of our Company, leaving the rest to keepe our Shippe and Houses, shipping the most part of them in a Pinnasse that was built by one named ———HOWARD, the Keele whereof hee made of a Canoa, which prooved a very fitting Pinnasse for those parts and Rivers. This Pinnasse after our Generall's death the Indians did breake a pieces because they thought wee would have stolne away from them in her unto the Spaniards. And the rest of our Company were placed in their Canoas, all of us furnished with our Caleevers: and so wee departed on our Journey and Voyage on the sixe and twentieth of February, on which day at night wee came to a place which wee named Mount Huntly, where wee lodged in the Woods that Night, our Generall commanding us to keepe a good watch; which wee need not to have done, for the Indians themselves were very watchfull, and wonderfull carefull of our Caleevers, and for to keepe our Powder drie, after we had beene acquainted with them, and very diligent for to please us. The next day at night we came to a place called the Coo, and there wee lodged, and the next day following we came into the River of Wia; and there we found two or three of the Caribes Canoas, but all their men were runne up into the Woodes, and from thence our Generall went up farther into the River of Caliane. But the Indians did advertize him, that there was an English ship there, whom the Generall knew to bee one JOHNSON of Plimmouth, that had beene some fourteene dayes before at Wiapoco, and came thither in the way of Trade. But Our Generall would not suffer him so to doe, for

that he would not hinder himselfe and his Company, which Our Generall at that time called to minde, and therefore thought it not good to proceed in the River, because hee doubted that there would have risen Contention betwixt his Company and JOHNSON'S, and for that hee also misdoubted wee should have wanted Bread and Drinke if hee should have proceeded in his journey, and therefore returned to Wiapoco, where we arrived all, except one Canoa about the fourteenth day of March.

Our Generall sent with foure of our Nation named BLAKE, OWEN GOLDWELL, WILLIAM CRANDALL, and HENRY POWELL, with Commodities up into the Countrey, some thirtie leagues to a place called Vrake, to the Inhabitants there named Arwakes, to trade with them. And after our journey by reason of such Raine and foule weather as wee had in the same, most of our Company fell sicke, and for that they had no comfortable drinkes, nor any comforts that sicke persons doe want, divers of them died of the Fluxe; which the Indians (as also the Disease called the Calenture) know right well for to cure, yet concealed it from our Generall. But unto us after his death they did reveall, which sicknesse amongst the Company caused no small griefe unto our Generall, and chiefly to see such wants amongst them; wherefore hee resolved with himselfe to goe for England, which hee acquainted the Company with, promising them to returne as speedily as hee could with provision.

Presently after he had shipped his provision, and such Commodities as hee had gathered together in the Countrey, and was in a readinesse to depart for England, he sickned of the Fluxe, and died aboord his ship, and was by Captaine HUNTLEY secretly buried on the Land, the

twentieth of March, whose death was so secretly kept by the Captaine, and the Master of the ship, that most of the Company knew not thereof. The reason was, because there was provision too little for them which were shipped, and others of the Company, if they had knowne thereof, would have pressed to have come with them. Wherefore Captaine HUNTLEY with Master TEDERINGTON our Preacher and others set saile from Wiapoco towards England, on the second of Aprill 1605, promising a ship to returne unto us within seven moneths, God not hindering their intents, which had happened, for Sir OLAVE LEIGH to his great charge had provided a great Fly-boat of the burthen of one hundred and seventy tunnes furnished for to have come for Wiapoco, as I have heard since my being here in London, before Captaine HUNTLEY his arrivall in England, but it pleased God that she never came to Wiapoco, so that we had no comfort of her, being in number, left at Captaine HUNTLIE'S departure out of the Countrey thirtie five persons, of whom one named RICHARD LACKSIE, was by Captaine LEIGH in his life time, appointed to bee Chiefe amongst us, who shipped himselfe into a ship of MIDDLEBOROUGH, who came into the River about the first of May 1605 and fourteene more of our Company with him, and more that Zelander would have carried if LACKSIE would have suffered him, such was his kindnesse towards our Nation. Hee gave unto us such wine and other comforts as he had, unto our great reliefes. His comming unto us to Wiapoco, was to have sold unto our Generall Negroes, whose kindnesse we did require in helping him to such commodities as wee had, and did get the Indians to provide Cassavi and Guinea Wheate for bread, with Potatoe Roots for his

Negroes to eat, who departed on the one and twentieth of May (after he had bin some three weekes in the River of Wiapoco) for Point de Ray, where he shipped of our Company into his Countrimen's ships, some in one ship and some into others for Holland, of which ships we heard that some of them were taken by the Spaniards, and they were cast over-boord with the Hollanders.

The same day the Hollander departed, which was the one and twentieth of May, came unto us a French ship of Saint Mallos, who dealt very kindly with us, wherefore wee did suffer him to trade with the Indians, who did remayne there some two moneths, unto whom many strange Indians did bring their Commodities, and at his departure hee shipped ten of our men: hee tooke Powder, and other Commodities of us which we had, for their passage into France, leaving tenne of us behind him, of which two died before the ship was out of ken of us, NICHOLAS WILKINS and ANDREW UNDERHILL. But within some fourteene dayes after, two of those foure which Our Generall had sent to trade unto Vrake, came unto us not expecting ever to have seene them; the other two were drowned by the way. These two named OWEN GOLDWELL, and WILLIAM CRANDALL, which came to us, reported they had beene some fortie miles up into the Land, in a very plaine pleasant Countrey, and brought Commodities hereafter written of.

About the middle of July, our number of ten were all in good health, spending our time in planting of Carow called Flaxe, whereof we planted about twentie English Acres of Land, and some Tabacco, observing the Manners and Conditions of the people, the Nature of the Land and what Commodities of ours are in most request with them.

About the third of October, the Indians did request us for to accompany them in their warres against the Caribes, whereunto wee willingly did agree. They provided seven Canoas, furnishing them with men, and bread and drinke, and their victuals (for the most part Crabs, and fish of divers sorts, which they take every day fresh and fresh as they travell in the Rivers). We went into the River of Caliane, which is some thirtie leagues from Wiapoco, where wee rowed up and downe, but we could not find any of the Caribes in the River, we perswaded them to land which they did, and marched up some two miles unto the Caribes houses; as wee marched to their houses, the Caribes came to the water side where our Canoas did lye, but finding my selfe there with my Caliver, they had no great desire to come very neere unto us; and so after wee had burned some of their houses, and killed divers of them, Our Company returned to our Canoas, having left one of the Indian Captaines named Macato, others of the Indians were shot with three of our Company, whom they healed as they did themselves, with a leafe, very speedily.

They are armed in their warres with naked skins, and their Artillery are Bowes and Arrowes, their Weapons woodden Swords and Bucklers. They choose their Captaine at their drunken Feasts; he is placed in the middest of the whole Company, holding his hands on his head. After they have made an Oration unto him to be valiant, and not to be treacherous unto them, with such like speeches; they whip him with a whip which maketh the bloud spring out of his bodie at every stroke, and he never once moveth there at. By these meanes they try his patience and courage. After we had shipped our

selves into our Canoas, wee rowed up and downe the river of Caliane, some eight or ten dayes, which wee noted for to be a very faire River and navigable. It runneth divers wayes from the Mayne Land; and great store of such Commodities hereafter specified, which the Country yeeldeth is to be had in the said River. We returned unto our houses at Wiapoco, about the first of November. In this journey we were kindly used of our consorts our Indians, and highly respected of them for our service which we did.

After a few dayes rest at Wiapoco, the Indians advertised us of three Ships which were in the River of Amasons, and that one of them would come unto us to the River of Wiapoco some two Moneths after, which proved to be true, but by what meanes they knewe it I could not imagine, except it were by their divels meanes, which they call their Peyar, with whom the men have often conference, and it will answere them, but to the women never that I could perceive: when the men will conferre with their Peyar they suffer not a childe to be in the house, and when any of them are sicke, they know by him whether they shall live or dye; if he saith they shall dye, they will give the sicke person no physicke; but if he say that he shall live, then they will give him any thing they have for his comfort. After our Company was advertised of a Shippe's Comming unto us, we went with the Indians in their Canoas, some into the River of Wiapoco, and some into the River of Aracow, to make away such Commodities as we had left which were not many, reserving some of them to give to our Indians for our victuals, although their kindenesse toward us was such, that if we had not had any Commodities, they

would not have suffered us to have wanted. In which our journey we noted the River of Aracow to be a very pleasant River, and yeeldeth such Commodities as other Rivers doe, also the River of Wiapoco is a very faire River, and navigable, which entreth the maine more than fortie Miles. And at the end thereof there is a very great fall of water which commeth over great hils and mountaines; some of our Company were on the tops of them, for some moneths in the yeare the Mountaines are drie, and we were informed that on the other side of those great hils, there is a River which is inhabited with many Indians, and hath the like Commodities that Wiapoco hath, and that there is Gold in that place, which the Indians calleth Carocoree, but wee never went to see the same River by reason we had very small store of Commodities.

At our returne to Wiapoco we gave to the Indians for their paines, and providing of us victuals in our journey an Axe, for which they would have travelled with us two or three moneths time if occason had required. And for an Axe they found us victuals two moneths time at our houses, as Bread, and Drinke, and Crabbes, and Fish, and all such kinde of flesh as they killed for themselves, for the same price: but if we desired any Hennes or Cockes of them, then we were to have given them some small trifles, as Beades: so likewise if they brought us in our travell to any of their friend Indian's houses, we must doe the like at our departure, to give them some trifles, as Knives and Beads. So that we lived very good cheape.

There are of the Indians three sorts which inhabit Wiapoco with whome wee were, whose houses be scitu-

ated as neere the River's mouth as they well may be, they are named the Yayes, the Arwackes, and the Suppayes. The Yayes are a people very proud, and use much shouting and mocking of others, much given unto dansing, and are full of merriment, very ingenious, and very kinde of Nature. The Arwackes are a people of better carriage, and did use our Company with better respect then the Yayes. These two kindes of Indians come out of the West, wherefore they doe know all those Coasts, and they hate the Spaniards as deadly as they doe the Caribes. The Suppayes are a people more craftie in their dealings, for they will not part with any thing, but will have Commodities for Commodities. They are not many of them, and wee could not learne from whence they are come. The men and women goe all naked, without any Coverture at all; they are very well limmed and proportioned of body. They never company together all the day time, but as the women doe bring them their victuals, they doe eate usually every day; they have doores at each end of their houses, the men remaine at the one end of the house, and the women at the other. The women are very neate in making of their Bread, which they call Aripo, and their drinke Passhe: they make their Bread and Drinke of a Roote which they call Cassavi, which maketh good Bread, and very strong drink, very pleasant to drinke after one is used to it.

Their houses are built after the manner of our barnes in England, but much longer, for we have measured some of them which were one hundred and fiftie paces long, and some twenty paces broad, one hundred persons keepe together in one of those houses; they are most

artificially builded and thatched, so that no raine commeth into them: Although in Aprill, May, and June, and most of July very extreame raine doth fall there. Also they make Pots of earth, which shew as if they were guilded, and some of them will hold thirtie or fortie gallons of liquor, they are very faire to behold, and very sweete to keepe any thing in. They make Baskets of divers sorts most artificially, and their beds which they call Hamakes; they are some of them made of Cotten wooll, and some of the barkes of trees, they use to lye in them hanging. They have a great delight to paint themselves both men and women, and especially when they goe to any Feast. The women against their day of travell in childe bearth, make for that time a roome apart in the house, whereunto they goe all alone, and are delivered without any helpe at all; and presently after the childe is borne, she calleth for her husband, and delivereth him the childe, who presently washeth it in a pot of water, and painteth it with sundry colours, which seemed very strange unto me, that I did not heare the woman, once so much as to groane, or to make any moane at all in all her time of her travell: if any one of them dieth they doe use to make great moane for them some ten or twelve daies together after his death or longer, according as the partie was beloved in his life time.

And touching such kinde of Beasts as are in the woods as well about Wiapoco as in other places of the Countrie. There are great store of Deere, Hares and Conies, Hogges, and many Monkies great and small, blacke and greene, which sorts are called Marmosites, and great red ones as bigge as Baboones (those the Indians doe kill and eate) and there are Leopards, and Porcupines, and

Lyons; for in one place we did see a Lyon which the Indians had killed; they brought all their boyes they had, and did lay them on the Lyon's backe, and with a whip did give every of them three lashes, wherefore they did so we could not learne, but imagined it was because they should remember the place where the Lyon was killed: also there are great store of Otters, and a beast which is called an Aligator, he hath a Cod that smelleth like the Muske Cod.

Of Foules, I have seene Cockes, Hennes, Ducks, and Geese; Partridges, Wood-doves, Hernshaws, Shovellers, and a foule of a Crimson colour called Passeray Flemingo, and great store of white foules, which the Indians call Wakcrouses, and great store of Parrats, and Parrakeits, which flye there in sholes like Starlings here in England: Also there is a Parrat there as bigge as a great Hen, blew and red, very beautifull to behold, and multitudes of foules of other sorts, and Hawkes of divers sorts in the Woods and Rivers.

And of fish there are great abundance of all sorts both of fresh water fish, and sea fish, and Crabbes great store; and the Indians take their fish with a kinde of wood, which they beate against some stone or other tree, untill one end thereof be all bruised, and putting that into the River, presently the fish become drunke, and run themselves on the shoare, and swim above water as our Haddockes doe in England.

There are store of good Rootes and Plantes with Fruites, as the Pina and Plantaine, Potatoes, Mappoyes and a fruite called of the Indians Poppoyes, it is bigger then an Apple and very pleasant to eate, and sundry sorts of Plums, and other sorts of

fruites whereof they make drinke very pleasant to be drunke.

There are these Commodities at Wiapoco, and in other places of the Countrie where I have travelled, Woods of blacke, red and yellow colours, Tobacco, Guinie pepper, Cotten woolle, Carow (of us called Flaxe) Anoto, Berries which dye a very faire Stammell Colour, Spignard, whereof a precious Oyle may be made, Gummes of divers sorts, Bee-waxe, Feathers of the best sorts, such as Ladies doe weare in their hats, and other Feathers abundance. There grow naturally in many places Sugar Canes, and great abundance of Carow of it selfe, called of us Flaxe, and of the Spaniard Pero. Also they make Oyle which they paint themselves with of a kind of Nut bigger then a Chestnut, whereof are great abundance growing; and the Manety stone is to be had in the Araçores Countrie, and in no other place of the Indies that I have heard. These things I noted, but if so we had expected certainely for to have had a Ship of our owne Nation to have come unto us, I My selfe, and the rest of us should have beene encouraged to have observed more than I have done. Neither had we any store of Commodities to trade up in the Maine, as the two Hollanders hath which are there, and were left there at our comming from thence by JOHN SIMS, Master of a Ship called the Hope of Amsterdam, of the burthen of one hundred tuns Freighted by the Merchants of Amsterdam, and by their Charter partie was bound to lye in the River of Wiapoco, and of Caliane six moneths time, which he did, for he lay with us at Wiapoco from the twentieth of December unto the twentieth of May following, trading with the Indians, and sought most

after the Manite Stone and Carow, which we called Flaxe. They furnished there two Factors very well with Commodities, which they left at Wiapoco. They dealt very kindely with us, for he shipped all our Company, which were nine of us.

Taking our leaves of the Indians (who were as unwilling to part from our Companies, as we were willing to goe into our owne Countrie, saying unto us, that if any of us ever came to them againe to trade with them; no other Nation should trade there but we. And after they knew of our departure; whilest we remained amongst them, they brought their children unto us for to name after our great men's names of England, which we did. They had often speech of Sir WALTER RAWLEIGH, and one came farre out of the Maine from Orenogue to enquire of us of him, saying he promised to have returned to them before that time. After we had provided our necessaries, and such Commodities as we had, and had given the Indians great charge of the Hollanders Factors, we shipped our selves and departed from Wiapoco on the last of May 1606. And from thence we went into the River of Caliane, where our Master JOHN SIMS traded some thirtie dayes with the Caribes, and other of the Indians. This SIMS was Master's Mate of the Holland Shippe which Captaine LEE found in the River of Wiapoco at his first Arrivall there: Also he was Master of the Ship which the Indians advertised us was in the River of Amazons, and according to their saying, God be thanked he came to us to our comforts.

After his departure out of the River of Caliane, he sailed unto Trinidado, where the Spaniards entertained him and his Companie very kindly, for they gave them

Tobacco for all such Commodities as they had, and suffered them to lade Pitch which goeth out of the ground there, for that our Master durst not goe to Point de Ree to lade Sault there as he determined, because hee heard that the Spaniard did lye there with their men of warre, and had taken certaine Holland Shippes, and had flung over boord all the men that were in them: Our Master tooke his course from Trinidado to Amsterdam, where he arrived on the———of———and were in number of us eight besides my selfe, named OWEN GOULDWELL, ROBERT GARDNER, WILLIAM CRANDALL, ROBERT BECKE, RICHARD PREW, WILLIAM FRIER, GILBERT BROWNE, and RICHARD BONECKE. Since my being here I understand that one of our Company which which we left at Vlushinge, named WILLIAM CRANDALL is gone in a Shippe of Holland for Wyapoco, which voyage they would have hired my selfe and others to have gone with them, by reason we have the Indians languages: such is the diligence of that Nation, unto whom I wish well for the great kindenesse they shewed myselfe and others of our Nation.

A Day in Barbados.

By Lady Blake, Jamaica.

AFTER crossing the Atlantic from Southampton to the West Indies—a voyage which, under the most favourable circumstances is wearisome and tedious to a degree—it must be a very morose individual indeed, who fails to be pleased with the first sight of the bright little island of Barbados, glittering with greenness, and looking like a great emerald rising out of a sapphire sea. It is a relief to look forward to an escape of even a few hours from the discomforts of the steamer, which, since the anchor has been down, have become so aggravated—what with the maddening noise of the steam winches and the unendurable heat caused by the steam being turned into the pipes that work them—that one cannot help thinking that the early Christians paid the Church a very poor compliment when they typified it as a ship; had they been acquainted with the horrors of a modern steamer taking in cargo in Carlisle Bay, the ship would no doubt have been handed down to us as the type of the nether regions.

Before leaving the stuffy cabin where so many wretched hours have been passed, it is advisable carefully to fasten the port-hole. Boats innumerable swarm round the ships, and it is by no means uncommon for a brawny brown arm to be inserted through the cabin-window, in search of any goods or chattels that may be within reach, sometimes a thick hooked wire being used to fish up any bag

or garment beyond reach of the hand. It is amusing to see the crowds of boats of all sizes and descriptions surrounding the steamer, from great barges, waiting to land cargo, to tiny little craft very much the size and shape of floating coffins, containing a couple of diving boys eagerly calling to the passengers to fling coppers to dive for. Making one's way as best one can down the ricketty ship's ladder that sways uncomfortably over the side, it is a relief to find oneself ensconced in one of the boats, and after a pull of about half a mile over the blue waters of the bay, it is delightful to find one's feet once more on solid land.

From the sea Barbados looks not unlike the "Little England," she proudly calls herself. Fields of sugar-cane seen from afar resemble pastures, numbers of wind-mills crown the gentle slopes, and clumps of trees when looked at from the distance of a couple of miles or so, appear much the same whether they be mahogany or ash, sea-grapes or alders.

The Barbadians, or "Bims" as they are sometimes termed, are often laughed at by the inhabitants of the other West Indian islands for their patriotic devotion to their island, but they have good grounds for pride in themselves and in their little spot of earth, for though in size and scenery it can claim no pre-eminence, its history is second in interest to that of hardly any other colony, and affords many striking pictures of loyalty, pluck and energy, often displayed under circumstances of much peril and difficulty.

Early settlers are as often as not little desirable members of the home population. Barbados seems to have been peculiarly fortunate in the class of men who first

made it their home. Domestic traders at home sent men to the island, "who" says Lord CLARENDON in his "History of the Rebellion" "had retired thither only to be quiet and to be free from the notice and oppressions in England, and without any ill-thought towards the King, many of them having served him with fidelity and courage during the war, and that being ended, made that island their refuge from further prosecution." OLDMIXON in his "History of the British Empire in America" gives an equally favourable report of the class of men who "planted" their island. "This island" he writes, "was the soonest peopled of all our colonies; the riches of the planters produced by that of the soil, tempted gentlemen of good families and modest estates, to transport themselves thither to improve them * * * and indeed whoever will look over the map of Barbados will find the country is not possessed by such a set of men as inhabit the other Plantations; on the contrary the WALRONDS, the FORTESCUES, the COLLITONS, the THORNHILLS, the FARMERS, the PICKERINGS, the LITTLETONS, the CODRINGTONS, the WILLOUGHBIES, the CHESTERS, the KENDALS, the DIMOCKS, the HAWLEYS, the STEELES, the BROMLEYS, and others are names of families the most ancient and honourable in England."

About the Aborigines of Barbados we kn w little or nothing. They must once have been numerous, as their stone and shell implements are frequently found, but how they were destroyed, and if they ever were destroyed or merely abandoned the island, we are ignorant. The Spaniards never seem to have made any settlement there, and one of the earliest notices of it is in 1563 when a Portuguese vessel bound for Margarita, being short of water

and finding herself becalmed off the island, the men went ashore to seek for water, which they found, and the Commander PEDRO A CAMPOS, gave the place the name by which it is still called. He also turned loose "hogs to breed upon it. which ye Indians of St. Vincent coming to know, they did some years after often visit it for hunting." The next notice we can find of the place is in 1605 when a certain Master CHARLES LEIGH and his companions bound for Guiana, landed and set up a cross with the inscription "JAMES K. of E. and of this island." In 1620 or thereabout, Capt. SIMON GORDON and "others" "hunted hogs without discovering any people there." In January 1627 the first settlement was made on "Barbattes" as one of these settlers writes it. They had the usual difficulties to contend with that befall pioneers. The land was uncleared and destitute of food-giving plants; and labour was scarce. TOM VERNEY, a son of Sir EDMUND VERNEY, the well-known Cavalier, mentions amongst the annoyances he met with when he went to Barbados some years later, "chiefly drunkenness" and land crabs. As to the former he writes "Were it not for that great sin, this would be one of the bravest islands I ever heard of, but it doth soe much increase, that I have seen upon a Sabbath day as I have been walking to Church, first one, presently another, lye in the highway, soe drunk that here be land crabs in the land that have bitt off some their fingers, some their toes, and hath killed some before they wakened, yet this doth not att all affright them." These land crabs, he continues "are innumerable, that you shall have them certayne months in the yeare be soe thick in the highwayes, that, doe what we can, we shall have them bite

through our shoes, that we are not able to undoe them till we break their clawes; they are very like our sea crabs, but nott all soe good, because most of them are poysonous."

The first arrivals were able to supply themselves with a certain amount of food in the flesh of the wild hogs, but they had no grain, or plants wherewith to stock the land. The leader of the expedition, Capt. HENRY POWELL, happened fortunately to be acquainted with the Dutch Governor of Essequibo, so he determined to visit Guiana and crave his help. Capt. GROENWEGEL was the worthy Dutchman's unmelodious name; he received POWELL with much kindness (they had formerly been comrades in arms in the service of the King of Spain) and gave him seeds and roots with which to stock the new plantation. Cassava, yams, maize, potatoes, bananas, oranges, and limes, pine-apples, melons, tobacco, cotton, annatto, to say nothing of sugar-cane and fowls were thus introduced into Barbados through the neighbourly kindness of the worthy GROENWEGEL, who moreover induced some 70 Arrawack Indians to accompany POWELL back to Barbados and show the colonists how to cultivate the newly imported plants and fruits.

We condemn the cruelty and perfidy with which the early Spanish Adventurers treated the native Indian populations, but it is unfortunately only too true that British colonists have often shown themselves as unfeeling and treacherous towards the inferior races as any "Don" of them all. In the West Indies the work of extermination had, in most instances, been so thoroughly accomplished by their predecessors, that England was

spared the disgrace that must ever stain the record of Spanish doings in the CARIBEES, but when oppression and even perfidy agreed with their material interests, unfortunately the Britishers' consciences have not been and are not over punctilious, if we may credit the stories that one still hears from Africa and Australia. The fate of the Arrawacks who accompanied POWELL to Barbados is a case in point. They had gone there on an agreement that at the end of two years, should they wish to do so, they were to be free to return to Guiana, and that as payment for their services they were to receive axes, hoes, knives, looking-glasses and beads to the value of fifty pounds sterling. But the labour of the Arrawacks was indispensable to the Colonists, the bargain was broken, and the Indians were quietly enslaved, One of them contrived to make his escape and reach Guiana, and his story so infuriated his countrymen against GROENWEGEL who had negotiated the arrangement between them and the Englishmen, that not only had the Dutch Governor to try to appease the Arrawacks by making them valuable presents, but had even to go the length of taking to himself a Carib wife, in order to secure the support of a tribe that was the inveterate foe of the Arrawacks. It was in Barbadoes that was enacted the climax of the once famous story of INKLE and YARICO. The fate of INKLE'S companions shipwrecked on the coast of Guiana and all but him murdered by the natives, may possibly have been partly the outcome of the treachery shewn to the Indians by those early planters many years before. The English sailor INKLE escaped to the woods, where he was discovered and succoured by the Indian girl YARICO, who unhappily for her, fell in love with

him. Accompanied by the girl, INKLE managed to get on board a ship bound for Barbados, and having arrived there the perfidious lover proceeded to turn his deliverer to account by selling her into slavery. STEELE has immortalized her wrongs, and YARICO may have reconciled herself to her fate, at any rate she seems to have made friends for herself in the island, as LIGON the historian extols her adroitness in extracting chigoes from the feet, her skill in which art must have won her the good will of sufferers from those insect pests.

The greater number of immigrants came from the counties of Cornwall, Devon, Stafford, Worcester, Hereford, Essex, Suffolk, and Kent. Most of them belonged to the party of the Royalists, though sympathisers with the Roundheads were not absent, but for some years both parties lived together on friendly terms. If any one called another "Cavalier" or "Roundhead," the offence was amiably condoned by a rule, that he who uttered the forbidden epithet must give a dinner to all those who had been present when the term had been used. Judging by the description LIGON gives of one of these feasts the penalty was no light one. The dinner in question was given by Col. DRAX, one of the wealthiest of the planters, to a sympathiser with the party of the Parliament. The Barbadian historian avowedly describes the banquet "for the honour of the land, which is no more than truth: because I have heard it slighted by some that seemed to know much of it." This is the menu he gives. "First then (because beef being the greatest rarity in the island, especially such as this is) I will begin with it, and of that sort there are these dishes at either mess, a rump boy'ld, a chine roasted, a large

piece of the breast roasted, the cheeks baked, of which is a dish to either mess, the tongue and part of the tripes minc'd for pyes, season'd with sweet herbs finely minc'd, suet, spice and currans: the legs, pallets and other ingredients for an *olio podrido* to either mess, a dish of marrow-bones, so, here are 14 dishes at the table and all of beef; and this he intends as the great *regalio*, to which he invites his fellow Planters, who having well eaten of it, the dishes are taken away, and another course brought in, which is a potato pudding, a dish of Scots collops of a leg of pork, as good as any in the world, a fricacy of the same, a dish of boyl'd chickens, a shoulder of a young goat dressed with his blood and time, a kid with a pudding in his belly, a sucking pig, which is there the fattest, whitest, and sweetest in the world, with the poynant sauce of the brains, salt, sage, and nutmeg done with claret-wine, a shoulder of mutton which is there a rare dish, a pasty of the side of a young goat and a side of a fat young shot upon it, well season'd with pepper and salt, and with some nutmeg, a loyn of veal, to which there wants no sauce being so well furnish'd with oranges, lemons and lymes, three young turkies in a dish, two capons, of which sort I have seen some extream large and very fat, two hens with eggs in a dish, four ducklings, eight turtle doves, and three rabbets; and for cold bak'd meats, two *Muscovia* ducks larded, and season'd well with pepper and salt; and these being taken off the table, another course is set on, and that is of *Westphalia* or *Spanish* bacon, dryed neat's tongues, botargo, pickled oysters, caviare, anchovies, olives, and (intermixt with these) custards, creams, some alone, some with preserves of plantines,

bonano, guavers, put in, and those preserv'd alone by themselves, cheese-cakes, puffes, which are to be made with English flower, and bread; for the cassavie will not serve for this kind of cookery; sometimes tansies, sometimes froizes, or amulets, and for fruit, plantines, bonanoes, guavers, milions, prickled pear, anchove pear, prickled apple, custard apple, water milions, and pines worth all that went before. To this meat you seldom fail of this drink, mobbie, beveridge, brandy, kill-devil, drink of the plantine, claret-wine, white-wine, and rhenish-wine, sherry, canary, red sack, wine of Fiall, with all spirits that come from *England*, and with all this, you shall find as cheerful a look, and as hearty a welcome, as any man can give to his best friends. And so much for the feast of an inland plantation."

To sit through, let alone to eat through such a bill of fare must indeed have been ample punishment for calling any number of nick-names. The planters seem to have had a far ampler supply of food for the body than for the mind. The only recreations which the giver of this stupendous feast seems to have been able to provide for his guests was to "make some of his negroes play at rapiers and dagger, which they did very skilfully, while he got some amusement by putting a muscovy duck into a pond and then making some of his negroes who could swim best, capture the duck in the water, but forbidding them to dive, so as to allow of better sport."

So, alternately toiling, trading and feasting, the settlers managed to pass several peaceful years. Tobacco seems to have been the first crop to occupy the attention of the planters, for as early as January, 1631, we find a minute from the Privy Council in England to the Earl of Carlisle,

who had a Patent for "the Caribees," to the effect that "The great abuse of tobacco, to the enervation of both body and courage, is so notorious that the King has directed the planting of it to be limited in St. Christopher's, Barbadoes, and all places under Carlisle's command, until such time as more staple commodities may be raised there. No other than sweet wholesome and well packed up tobacco was to be exported, and that delivered at the port of London only."

Sugar-cane had been introduced at the same time as tobacco, but at first was only used for making a drink from its juice. In 1640 the making of sugar began, but it was not till five years later that the manufacture became general. By that time the population had much increased, and during the Civil War in England the Dutch furnished the planters not only with negroes to work the estates, but also with all the machinery for the making of sugar. As the political horizon darkened at home, it cast its gloom over "far Barbados." Opprobious epithets began to be used in real earnest, and could no longer be atoned for by a festive gathering. The division between the two parties grew sharp and bitter. The Cavaliers were greatly in the majority, and at their head was Col. HUMPHREY WALROND from Devonshire, who had been a hostage amongst the Roundheads from the Royal Army, and had lost thirty thousand pounds in the King's cause. As the loyalists met with greater reverses at home, more and more ruined cavaliers flocked to Barbados, and, embittered by the treatment they had experienced at home, the obvious plan not unnaturally occured to them to repair their broken fortunes with the estates and goods of the wealthy and

comparatively few Roundheads now seemingly at their mercy. Matters were brought to a crisis by the arrival of an agent from Bermuda, requesting the Barbadians to make an offensive and defensive league with that island, in declaring for the King and in driving out all those who were well affected to the Parliament. This seemed the very opportunity so ardently desired by the more fiery of the Cavaliers, but Col. DRAX "who lived like a Prince" had too large a stake in the island to allow such a bolt to be hurled; his influence was great, and he exerted it successfully in opposition to the proposed treaty. It is impossible here to enter into the details of the strife and contentions that now rent Barbados, the scenes enacted there were more or less a reproduction in miniature of the discords by which the old country was torn. Col. DRAX and a number of the Roundheads, took ships and went to England to lay their grievances before the Committee for Trade and Plantations, with President BRADSHAW at its head, and to crave assistance from the Parliament. The result was that the colonists were proclaimed rebels, and a fleet, commanded by Sir GEORGE AYSCUE, was despatched to reduce them to obedience.

Barbados was nothing daunted. The hopes of the Royalists ran high; they were inspirited by hearing that gallant Prince RUPERT and his brother MAURICE were on their way to the West Indies with the portion of the fleet that had remained loyal. On the 3rd of May 1650, CHARLES the 2nd was proclaimed "King of England, and of Barbados and of all the other English Plantations," and when news came that he had landed in England, and their friends the Dutch assured the islanders that

they fully believed the King had by then established himself in London, the Barbadians fairly went mad for joy, as a letter in the *Mercurius Bellonicus* wrote describing the receipt of the false intelligence in Barbados "which the said credulous souls believed (who fancy fables and make them their refuge) and upon these was made Bone-fires, ranting, tearing and dancing, as if the Devil had been dead or hell not space enough to receive them."

When the news came of the sailing of the Parliamentary fleet, the island had been put in a state of defence. "If ever they get the Island, it shall cost them more than it is worth before they have it," wrote the Governor, Lord WILLOUGHBY of Parham, to his wife who had stayed in England.

On the 15th October 1651, AYSCUE'S fleet appeared off Barbados, but although some weeks later this fleet was strengthened by the arrival of another bound for Virginia, where it had a similar task to perform in the reduction of the Royalists in that colony,—for more than two months the island made a gallant defence against all the might of an English fleet. So resolute were the islanders, that AYSCUE, having liberated some prisoners he had taken, "fearing they should eat the provisions, of which the supply was sufficient for the wants of the fleet only," and having informed them of the state of affairs at home, where OLIVER was carrying all before him, the liberated men were desired to let the news be known to their neighbours, when two of the prisoners did so they were promptly hanged by their fellow colonists soon after landing. Had Prince RUPERT'S arrival not been delayed by his factious subordinates, it is possible that

the defence might have been a successful one, but dispirited by the dejection of Col. MODIFORD (a leading planter, afterwards Governor of Jamaica) and discouraged by the doubts and representations of the "Peace party" formed by the machinations of MODIFORD, the Cavaliers af length agreed to capitulate, and in doing so secured "The Charter of Barbados," which ensured honourable terms for the island and its defenders. So favourable indeed were the terms granted to the Royalists that Vice-Admiral PARK wrote home saying "there were some things which we were very unwilling to grant." With all the traditions of the brave West Countrymen and retaining much of their energy and loyalty, it is not surprising that the Barbadians are a sturdy self-relying community, though it must be admitted that they occasionally assert their superiority more emphatically than is altogether agreeable to their neighbours.

Having only a few hours to spend in the island we could not hope for more than a cursory glimpse ot it. It was with great pleasure we availed ourselves of the kind invitation of the Governor and Lady HAY to accompany them on an expedition by special train to the south west of the island, which as the railroad runs right across, would give us an opportunity of getting a general impression of its characteristics. The capital, Bridgetown, is clean and picturesque, no sleepy, worn-out place, with weed-choked streets and lazy inhabitants, such as West Indian towns are sometimes depicted. The shops are commodious and well stocked, the hum of business is on all sides. Tram-cars run along the principal streets, which are thronged with busy, chattering

crowds of men, women and children; unkempt donkeys, carrying great loads, and drays of sugar, picturesque with the many mules that form the team, the drivers cracking very formidable-looking whips. The women are mostly dressed in white, their heads being bound in white handkerchiefs very becoming to their dark skins. The houses are small and low, but generally neat, and altogether the town has a thriving, contented appearance. We passed a tavern with pink walls, on which were depicted sprays of inebriated looking roses; it bore the name of the "Rose of Devon," and the petition in large letters to "Heave to."

The suburbs of Bridgetown, through which the railway runs, are not prepossessing. The houses are so small that they resemble sentry boxes more than habitations, and are many of them in a very tumble-down condition; they are crowded closely together, and the fences and yards look shattering and neglected. Evidently the inhabitants have little cash, time or inclination to bestow on such minor matters as repairing or adorning their dwellings. Barbados is more thickly populated per acre than any other spot of earth, not excluding China. The negroes have there to encounter the hard struggle for existence from which their brethren in the other islands are exempt, and in consequence are hard working as the sternest of political economists would desire. But the island is small, the population very large, the profits from sugar-cultivation are diminishing and wages consequently are low. Barbados has all her eggs in one basket, and one cannot help wondering, when hearing of diseased canes and falling-markets, what would become of the place should any number of

the estates be "thrown up." Barbados altogether gives one a different impression from that one usually expects from a West Indian island. It is not

> "A place for idle eyes and ears,
> A cobwebbed nook of dreams."

No land in which to eat the Lotos, and gather fruit that one has not sown; man and beast must there work their hardest, the struggle for existence is in full swing. "Little England" is

> "A Land of settled government,
> A Land of just and old renown
> Where Freedom broadens slowly down
> From precedent to precedent."

She may e'er long have the problem before her that is pressing unpleasantly close on Old England, what is to be done with a population which, should industry cease to pay, is superabundant. It is earnestly to be hoped the leading men in the island will endeavour to find a solution to the question before it is asked by a starving population for whom no work can be found.

The interior of the island is decidedly ugly and monotonous. In all directions stretch cane-pieces, with here and there, patches of sweet potatoes, yams or guinea-corn. There are no fences; occasionally come small clumps of mahogany trees of no great size, or a line of tall, slender cabbage-palms by a road-side, looking like so many green-headed mops. Hardly a flower is to be seen, every weed is turned up and hoed into the fields as manure. In one cane-piece we saw a white overseer, mounted on a sorry nag, superintending a gang of negroes. He wore a mask over the lower part of his face. We inquired the reason, and were informed that it is "the custom in the island," a custom which has probably arisen from the

fact that when white people work in the fields exposed to the sun, their lips are apt to blister, and after a time to fall away from the teeth, the face becoming scarred as if from a burn. The manual labour on the estates is all done by negroes. They are divided into three gangs. The first consists of able-bodied men who each receive 10d. a day; the second gang is composed of women who are paid 8d. or 9d. a day; in the third gang are all the children who do light work such as weeding, for which they are paid 3d. to 6d. a head. These wages are not high,—accordingly to ideas in England, they are ridiculously low,—but as things are in the tropics, they are sufficient to enable the negroes to live, to multiply contentedly, and though many of them would gain double or treble if they would emigrate to the other islands, their devotion to Barbados is like that of the Irish to Ireland previous to 1848, and they will not consent to seek work elsewhere. If the life of the labourer in Barbados is one of effort, that of the animals on the estates, must be one of nearly constant suffering, for all we saw looked more than half-starved. It was pitiful to see the small stunted oxen, looking almost like anatomical specimens, toiling painfully, many of them lame, dragging their heavy loads through the cane-pieces. When the weary work is over there are no refreshing pastures into which to turn them, only pens (in the English not the Jamaican sense) in ploughed up fields, where cane tops are flung to them as scanty nourishment. We passed some of the old estate "Great Houses," two-storied and substantially built. They had no gardens, the canes came close under the windows, and the "works" were hard by.

It was not till we reached the southern shore that we realized that Barbados has a claim to her share of the heritage of beauty that is the birthright of the West Indies. The coast-line rose so as to form cliffs of a considerable height, the dazzling white surf beating on a creamy coral strand at their feet, head-land stretched beyond head-land till they melted away in the blue hazy distance. The glossy foliage of manchioneel trees growing luxuriantly on the shore; the green picturesque forms and beautiful colours of the sea-grapes that stretched their fine boughs towards the waves, as if to invigorate their copper-coloured and red-veined green leaves in the refreshing spray; while high over them towered the cocoa-nut palms, giving a tropical look to the scenery that hitherto has been absent. An oily substance was pointed out to us floating on the waves; this was petroleum. The rocks along the coast are coated with it, as it trickles down the cliffs. The hill forming one of the highest of these cliffs still bears the name of Burnt Hill; its baked red earth is sometimes brought into Bridgetown and used for making walks and paths. This hill is said to have been found burning by the early English settlers, and so remained till it burnt itself out. The tradition is that it was set on fire by the Caribs, possibly by those who came hog-hunting from St. Vincent. At present no attempt is made to work the petroleum, which perhaps may ultimately prove a much-needed second string to the Barbadian bow.

We got out of the train—which literally drew up at the door of a sea-side lodge called "Quamine's." Long ago an old freed slave called QUAMINE had built a shanty there, and his name is kept green by the present com-

fortable little fishing lodge. The coast abounds in fish of all sorts and hues. There was a stage in the surf on which a fisher could sit at ease and fish in a deep pool beyond it for grunt, snapper, parrot-fish, mullet; and fish of unknown names, wonderful shapes and indescribably vivid and beautiful colours. Outside the coral reef, in the deep ocean, is where the flying-fish are taken. To capture these the sea has to be "scented" with the previous day's catch, then a line is thrown out by a fisherman and as soon as he has hooked a flying-fish, it is fastened through a small aperture in the bottom of a shallow net some three or four feet in diameter. This is placed alongside the boat and in come the fish rushing headlong after their companion, and are forthwith ladled into the boat. Flying-fish are rather dry, but taste somewhat like smelts, the roes fried is a favourite dish with Barbadian epicures. As we walked down to the beach we passed a group of copper-coloured men and stopped to speak to them. They belonged to the class known in the island as "Red-legs." Though almost resembling Red Indians in colour, they are white men by race and have not mixed with the coloured population. The fierce sun of the tropics has burnt them to the hue of bricks, but the young children are quite fair-skinned. They are the poorest of the poor, eking out a scanty livelihood as fishermen; the white race cannot do hard work in the fields and survive long, they have no land or means of obtaining any, consequently their only resource is fishing. The name "Red-legs" is said to have originated in CROMWELL'S time, when his English soldiers seeing northern men advancing against them clad in kilts, called out in derision "Here

come the Red-legs." The name has stuck to the white fishermen, many of whom are believed to be descendants of those most miserable of men the Europeans banished to work on estates in the plantations. These were known as "Christian Servants," or "Apprentices" as they came to be called later on, for the Lords of Trade and Plantations at home were scrupulous, and we find by an "Act for the good governing of Christian Servants" made in 1676, that "their Lordships were not pleased with the word *servitude*, being a mark of bondage and slavery, and thought fit rather to use the word *Service*, since these servants are only apprentices for years." Their lot was a far harder one than that of the negro slaves. It was a very brutal or exceptionally short sighted owner who worked his slaves to death; they were his goods and chattels, and few men wantonly destroy their own property. But as the "Christian servants" were only bondsmen for a term of years, and no large amount of capital had been expended in purchasing them, and as at the end of five years the Christian servant was entitled to ten pounds sterling, "if his master be soe honest as to pay it," it was an actual pecuniary gain to the employer should the servant not live till the expiration of the term. The Irish prisoners taken by CROMWELL were about the first exported in large numbers to the colonies. As OLIVER reported after the taking of Drogheda, "When they submitted their officers were knocked on the head; and every tenth man of the soldiers killed, and the rest shipped for Barbadoes. The soldiers in the other towns were all spared as to their lives only, and shipped likewise for the Barbadoes." But not only prisoners taken in war

were sent, apprentices were recruited in various ways. "Vagrants, rogues and idle persons that can give no account of themselves, felons who have the benefit of clergy, such as are convicted of petty larceny, vagabonds, gipsies and loose persons * * * were to be transported from the nearest sea-port, and to serve four years according to the laws and customs of those islands, if over 20 years of age, and seven years if under 20." Some were content to enter voluntarily into bondage. In 1662 we find that "among those who repair to Bristol from all parts to be transported for servants to His Majesty's plantations beyond seas, some are husbands that have forsaken their wives, others wives who have abandoned their husbands: some are children and apprentices run away from their parents and masters; oftentimes runaway credulous persons have been tempted on board by men-stealers." These men-stealers indeed supplied a large proportion of the white labour for the colonies, and came to be known as "spirits." Petitions and minutes concerning them are frequent, one or two examples will be sufficient to quote. In 1671 we find affidavits of MARY wife of MARK COLLINS, and THOMAS STONE against WILLIAM HAVERLAND, "generally called a spirit." Also of WILLIAM HAVERLAND against "JOHN STEWARD for spiriting persons to Barbados, Virginia, Jamaica and other places for twelve years, five hundred in a year as he has confessed. Also against WILLIAM THIEVE who in one year spirited away 840, "against ROBERT BAYLEY "an old spirit who hath no other way of livelihood, and others 'spirits,'" and so on.

In 1666 a certain H. WEDDIMAN wrote to one GEORGE

POWELL "The resolution about the Scotch rebels is to hang all ministers and officers: of the common sort one in ten is executed, and the rest sent to the Plantations." However, it was not always that those of a better condition were lucky enough to be hung or knocked on the head, many "gently born" were sent to the slow torture of blistering out their lives under the burning sun of the tropics, herded together with malefactors and vagabonds, for it is distinctly stated that thither were sent "many persons of quality transported in the late time of rebellion."

It is true that, as wrote one of the governors of Barbados, "Europe is the magazine of people, and from thence His Majesty ought to send them a constant supply every year," but the portion of Europe whence the supply was most constantly drawn appears to have been Ireland. The State Papers teem with references to the transportation of the Irish, merely on account of their nationality, from which we will only extract a few instances. In April 1647 the Council of State stated to the Committee of Merchants that they "are informed that 170 Irish have been taken at sea, who pretend they were going to Middleburgh. Desire them to treat with those who trade to the English plantations to transport the common men thither, where their services may be made use of." A few years later a certain Alderman TICHBORNE is desired to present to Parliament the "draft of an Act concerning the transporting of poor Irish children to England and the western plantations." In the same year comes an order for a licence to Sir JOHN CLOTSWORTHY for the transportation of "five hundred natural Irishmen." The Bar-

badians appear to have been dissatisfied at the large proportion of Irish servants sent to them and there are complaints of their turbulence and inefficiency. In 1660 the Council of the island ordered "Churchwardens to take an exact list of all Irish in their several parishes and return the names of turbulent and dangerous spirits."

Amongst grievances complained of by the colonists was that "Irish Servants they found of small value." In 1667 WILLIAM, Lord WILLOUGHBY, then Governor, wrote from Barbados, "Here are 2,000 Irish" and he "wishes he had so many Scots for them." Again he says of the Servants that "a very great part Irish, (are) derided by the negroes as white slaves." The "white slaves" must often have envied the lot of the more fortunate negroes. In 1647 their hardships were such as to drive them into a conspiracy and rise, with intent to kill their employers and take possession of the island. The plot however, was discovered, and eighteen of the conspirators were put to death. The mortality amongst these people was enormous. "It has been found by woeful experience, that in all new settlements whither people are removed from the old ones, ten die for one that comes fresh and raw out of Europe" is the testimony of one Governor of the island. This was not surprising when we hear of one eye-witness writing that he had "inspected many plantations and seen 30 or 40 English, Scotch and Irish, at work in the parching sun, without shirt, shoe, or stocking, and negroes at their trade in good condition." The astonishing thing is not that most of the European labourers died, but that any should have survived, and left descendants. Of course all masters were not equally callous and inhumane to their white slaves,

but it is not inconceivable that a Cavalier who had suffered bitter loss and wrong in England should have shewn small consideration or indulgence towards any white labourer with Puritan tendencies. When the King came to his own again and to his turn of banishing enemies, the Roundhead masters probably looked on the working to death of "Malignants" or Irish "Tories" as an act of righteous judgment on adherents of "the Man of Sin" and worshippers of "the Scarlet Lady on the Seven Hills." The possibilities that surround the ancestors of the "Red-legs" invest the poor people with a particular interest, though of course, the origin of many of them may be anything but romantic, as now-a-days the white fishermen are all called "Red-legs." Those we saw had Scotch names and all they knew of their history was that their ancestors had come from Scotland. They were tall, well-made men, but they appeared dull and spiritless, and I was struck by the listless and cramped expression of their countenances. They seemed men who had small interest in their surroundings, and little hope in life.

Our day in Barbados was drawing to a close. It was time to return to catch the steamer, so we turned with regret from a search on the tempting beach for the tiny green shells found there sometimes in abundance, and took our places in the funny little train, the lines of which curve along often in unpleasantly close proximity to the edge of the cliffs. On our way back we noticed a large building surrounded by a wall. It was the prison. This stands in a district called St. Michael's, most probably what was the St. Michael's Town of former days. If so, somewhere hard by died the miscreant beneath

whose stroke, according to his own confession, fell "the comely head" of England's unhappy King. On September 30th, 1670, one JO. NEWINGTON wrote from St. Michael's Town, Barbados, to JAMES DRAWATER, Merchant at JO. LINDUPPE'S, at the Bunch of Grapes in King's Yard, by Temple Bar, "All the news he can write is that one HUGH PEACHELL, who has lived in this island almost 20 years with many persons of good esteem, and lately with Col. BARWICK, and whom it was observed gained much money, yet none thrived less than he, falling sick three weeks since, was much troubled in his conscience, but would not utter himself to any, but a minister, who being sent for, he did acknowledge himself the person that cut off the head of King CHARLES for which he had £100, and with much seeming penitence and receiving such comfort, as the divine, one parson LESHLEY, an eminent man here, could afford him, he died in a quarter of an hour. This he may report for a real truth. One Mr. HEMEL, condemned for the same, and he thinks now in Newgate, will be glad to be acquainted of this."

Our ship was just ready to get under weigh, as we went on board. The tropic sun was sinking serenely into its ocean bed, and as we steamed westwards to the far more lovely island of our destination and watched "Little England" fading away in the distance, we heartily wished it "good-luck," and felt we should always retain a feeling of interest in the fortunes for "weal or woe" of the island whose soil has a certain sacredness on account of the sufferings and surviving of so many of our countrymen who toiled and pined and died in "Far Barbados on the Western Main."

In Macoushia.

By C. A. Lloyd.

TO reach the Savannahs in Macoushi Country there are two recognised routes—one by way of the Mazaruni River and the other by the Essequebo and Rupununi. The former route is however seldom chosen owing to the difficulty of securing food, as well as from the roughness of the country over which it passes, it was therefore the latter line of travel we selected when first we visited Macoushi land in June, 1891 The Rupununi is an affluent of the Essequebo River on its left bank, and like some other large rivers in the colony is very unpicturesque. It is chiefly remarkable for its winding course and the clouds of sand-flies which continually annoy the traveller whilst slowly paddling up its muddy and sluggish stream. For a few days from its mouth its banks are clothed with forest trees similar to those one has already seen lower down on the Essequebo, but these gradually become lower in height until now and again you catch passing glimpses of savannah, with here and there the blue top of a mountain rising in the distance. At first this shifting of scene from tree-clad banks to broad patches of open grassy land pleased us much, but at length it became irksome and monotonous, and it was with great relief we arrived at our place of destination—the waterside landing at Quimatta. This is an Indian Village consisting of about thirty huts, with a roving population varying from twenty to eighty, and a queer

lopsided edifice designated the church, though a more unecclesiastical looking structure it would be difficult to imagine.

No two Indian Villages are laid out alike, nor are the houses always built on the same principle. In some Villages the houses are arranged in a semi-circle, but as a rule they are arranged on no definite plan—close together or far apart, as suits the fancy of the builder. The site is generally the summit of one of those small undulating hills so characteristic of the savannah, and is quite a necessary precaution against the annual inundations of the lower lying country. The circular form of house is most common on the savannahs, but we have seen them of different shapes —often squared at the ends and raised upon piles about five or six feet above the ground, a rough ladder affording means of ingress and egress to the inmates. There is nothing particularly interesting about the surroundings of an Indian settlement. No trees are about the place except one or two low straggling cotton bushes and here and there a stunted Cashew or Curatella. A few aroids are occasionally grown near the huts as "beenas" (charms), but these are small and inconspicuous and are easily passed over unnoticed. Packs of hungry, snarling dogs bark at one as he goes by, and parrots, macaws and bill-birds (toucans), roam from hut to hut at their own sweet will, whilst fowls of a very small breed eke out an existence in a marvellous manner. They are never fed or have water given them, and except the iron-stone pebbles about the grass, it is hard to think what they can find to eat. It often puzzled us much to know from what source the people obtained their provisions, but we

soon discovered that their fields were frequently situated as much as a day's journey from the village. Here, in a strip of timber covered country, an opening is made and a miscellaneous assortment of vegetables planted. Manioc or cassava is the chief vegetable grown, but only the bitter sort, which is used for making bread; the sweet cassava so commonly seen in Georgetown being a thing unknown. Next will come a patch of pine apples interspersed with the different varieties of Capsicums, from the tiny "Bimiti-eye" (Humming-bird's eye) bird-pepper, about the size of a B. B. shot, to the pungent "Buckramanni" of three or four inches in length. Around the sides of the clearing bananas gracefully wave their broad glossy leaves, and yam and potato vines struggle with each other for some object to twine upon. Here and there also, the tobacco plant displays its hoary foliage and pretty spikes of pinkish flowers, while the digitate leaves of the papaw (Carica papaya), borne aloft on trunks like tall barber's poles dot the clearing at intervals.

Quimatta is situated on the edge of the savannah and is really a capital place for any one visiting the district to make his headquarters, the only great drawback during the dry season being the scarcity of water, which has to be fetched from the River about three miles distant. Our first impression of the savannah was by no means favourable, for apart from the novelty of beholding for the first time an open country stretching away in the distance as far as the eye could reach, the apparent paucity of animal life of any kind and the solemn quietude of our surroundings was most distracting and almost calculated to madden us. After a few weeks' ex-

ploring from one district to another, however, it gradually dawned upon us that there were many worse places in the world, and when the time came to bid adieu to our savannah home, we confess that we did so with genuine regret.

The ordinary traveller will find little to interest him here and the ennui of a lengthy stay would be trying in the extreme. But, ere he hastily concludes the savannahs to be monotonous and tiresome, we would advise him to visit the mountain ranges that intersect these vast undulating plains. Let him look on the emerald green valleys that nestle in their rugged bosoms and he will realize the fact that he travels in a country rich in dainty bits of mountain and valley scenery, eclipsed perhaps by nothing he has beheld in any other part of the globe. The rare picturesqueness of this corner of Guiana must be seen to be appreciated, for no word painting can adequately convey the faintest idea of the lovely scenes a journey of two hundred miles from Georgetown will disclose.

The Macoushi Indian is a pleasant companion, and to live with him for a time and observe his ways is quite a study in Ethnology. He is a most simple hearted and guileless creature, and has many good traits. He is civil, amiable, and possessed of a high degree of intelligence—he is fond of music and will acquire a strange air in an incredibly short space of time. But he has his bad points too—he is exceedingly indolent, and the least said about his veracity the better. However on the whole, MARK TWAIN'S remark, that, "Ingins wherever found is pisin," however aptly it may apply to the red man of the North would be cruel and unjust if applied to his gentler confrère of

these southern climes. Of course, when speaking thus of the Macoushi we refer exclusively to those who have had no contact with civilization. The Indian, one sees about the streets of Georgetown, is but a degraded type of his happy, honest brother on the savannahs, who would be as much out of his sphere in the City as would the sable African at the North Pole.

We got on well with our Macoushi friends, and though they sometimes annoyed us with exorbitant requests we grew to like them and they in turn appeared fond of us. We soon learnt from them that the savannah was not so barren a place as we at first thought, and that game was plentiful enough if we only knew when and where to look for it. It is true that the sportsman may walk for miles without seeing a living thing worth shooting, but if he trusts his Indian friends he will have plenty of use for his gun. The wild Muscovy duck (Cairina moschata) can be obtained all the year round, and at certain seasons by the thousands. But they must be sought for in the swamps, which owing to the swarms of bush-ticks and mosquitoes, are rendered almost unapproachable to any but the Indian, who will keep your larder constantly supplied. The sportsman however need not despair, for rare sport can be had with the birds on moonlight nights. Having discovered during the day on the banks of some creek or lagoon a tree resorted to by them as a roosting place, we start early in the evening with our Indian companions, and hiding in the thick shrubbery at the root of the tree fire away at the birds as they come to roost. Fine sport may then be obtained, for on one occasion we bagged over twenty of the finest Muscovy ducks we had ever seen. Several other smaller ducks

(Dendrocygna sp.) are also very plentiful, and we have often imagined the havock a punt gun would commit amongst their countless flocks. We have also sometimes seen them swimming about the quiet lagoons, the reedy banks of which afford such admirable cover for the sportsman and allow him to steal upon them unobserved. In the wood-covered portions of the Savannah the large red deer or "Saree" of the Indians (Coassus rufus) abounds, whilst two other smaller species (Coriacus savannarum and Coassus nemorivagus) are equally abundant, but we require a thorough knowledge of their habits to be able to see, much less to stalk them. Here the wily red man is again equal to the occasion and many a noble animal falls to his prowess, as is evidenced by the numerous antlered skulls tied by way of ornament to the centre pole of his mud and thatch hut.

We once accompanied the Indians on a deer hunt and were away from the village for over a week. Every man, woman and child turned out—even mothers with suckling babes at their breasts and old grannies with their monkeys and parrots, followed by a host of half-starved miserable looking curs. The village was entirely deserted, the only living creatures left about the place being the fowls and one unruly Macaw which refused to allow itself to be caught. We walked westward from the village for I suppose about six hours when we arrived at a hollow basin of water in the solid rock beautifully embowered by colonnades of eta palms festooned with Noranteas. The water in this spring was clear and limpid, and the palms and other trees around were reflected on its bosom as on the brightest mirror. The

place was known as " Brankirrie bye" (white man's well) and a more romantic spot could hardly be imagined. A couple of palm-covered sheds were soon constructed and our hammocks slung beneath them. Some of the men had meanwhile started to reconnoitre the neighbourhood and returned by dusk with the intelligence that they had seen the spoor of " Wikiri" (deer) and that on the morrow they anticipated good sport. All through the long hours of darkness we lay in our hammock, unable to sleep, smoking and listening to the voices of the night. Ever and anon the melancholy whistling notes of the Maam (Tinamus subcristatus) would break the stillness, and the treble of a species of frog, (Hyla) was kept up so continuously as to become annoying. Heartily did we wish the noisy Batrachian miles away. At length morning approached, the resonant cries of the red howling monkey (Mycetes seniculus) announcing the fact, and with the dawn arose the huntsmen. Away they went in quest of their quarry, their dusky forms appearing, in the "dim religious light of morning," more like phantoms than human beings. Stealthily did they move and suddenly vanish under the grey shadows of the trees. As the sun peeped above the horizon the young lads who had not joined the hunting party proceeded to build a barbacue on which to dry the game the hunters might bring in, at the same time the women began to fetch fire wood, and afterwards went fishing in the pool with tiny hooks, and lines neatly spun from the fibre of a species of Nidularium. The fish they caught, however, were not inviting,—they were small and black, and apparently all of one species.

After looking on for a short time we started with our

gun towards a pretty green valley about one thousand yards to the south of our camp. Here we found a veritable flower garden. Over the grass and sedges the deep blue flowers of Burmannia bicolor cast a sort of prismatic bloom, which, mingling with the purple, pink and yellow of the Utricularias, gave an indescribable charm to the place. Various species of Pæpalanthus bespangled the margins of tiny rills with their rosettes of leaves and star-like flowers, and dew-drops glistened like diamonds on the glands of a pretty little Drosera. These interesting plants embroidered shallow pools, on the white sandy bottoms of which the Ram's-horn Apple Snail (Ampullaria cornu-arietes) revelled in bliss, while the sides of the valley were fringed with stately eta palms which reared their graceful fronds, towards the clear blue sky. The dry rounded knolls were coloured by the bright yellow racemes of Byrsonima which flecked the grass like golden sunbeams.

We have read of the flower prairies of North America and of the glades of wild Hyacinths in the Old Country; these must indeed be beautiful, but we doubt not that this humble little grass-plot away in the heart of the sultry savannah could vie in its varied display of floral garniture with any of them. We ranged the little valley over and over again, gathering plants and vainly endeavouring to stalk a couple of Jabirus (Mycteria americana) which however seemed to guess our intentions and kept well out of range. Discouraged therefore at not succeeding with the birds, and the inner man having warned us that it was past our breakfast hour, we hastily retraced our steps and arrived at the camp just in time to witness the return of the huntsmen.

Their anticipations had been fully realized, for each man had bagged his deer, and four splendid animals lay stretched on the ground before us. Two of the men had not yet come in, but while we were at breakfast one of them made his appearance and announced that he had slaughtered a Maipurie (Tapirus americanus) and had come for assistance to bring it home. The women seemed frantic with joy at this news, and shouldering their "Suriannas," made off into the Savannah, followed by the huntsman. They returned some hours afterwards laden with Tapir flesh, which together with that of the deer, was soon drying on the "barbecue" over a blazing fire. It was late in the evening before the last man arrived—he had not succeeded in securing his deer, but had shot two Savannah Powie (Mitua tomentosa) and two Accouries (Dasyprocta agouti).

We remained at this place for over nine days, the Indians bringing in fresh supplies of meat daily while we were collecting plants. One day a party of strange Indians paid us a visit. They too had been on a hunting expedition and were returning to their homes in the "Canaku Mountains," but attracted by the smoke of our camp fires, they dropped in to see who we were. Among them was the headman of their Village; he looked an intelligent fellow and was of good *physique*. We spoke to him through one of our men, who understood English fairly well and acted the part of interpreter. He seemed glad to give information concerning his part of the country and amongst other things informed us that a Harpy Eagle *(Thrasaetus harpyia)* had its nest close to his house and had lately carried off a tame peccary. The "Guanu" (Harpy) he said was

very bold, and, besides the peccary, had also taken some of his fowls. Its nest was in a large silk-cotton tree, and he knew that there was a young one in it as he had often heard it crying. We told him we should like to obtain the bird and if he agreed to send his men home and go with us to the village where we had our things, we would make him a present of a few tins of powder for guiding us to the spot. He willingly accepted this proposal, and sent his party away the same evening.

Next day at three o'clock we were safely back at our old quarters. All was just as we left it; our barter stuff was untouched, and the old macaw demurely perching on the roof of a hut yelled a lusty welcome as we passed him. Here we stayed for three days trying to induce some of the men to accompany us; at first they appeared unwilling to leave their homes so shortly after their return, but at last we succeeded in engaging two men and a woman, and off we started early on the fourth morning.

We walked all day until, footsore and weary, we decided to halt in a small clump of trees which was the only shelter available within the next ten miles. Our frugal dinner over we tumbled into our hammocks and slept the sleep of the weary. In the morning we were up early, feeling much refreshed, and when the sun rose were well on our journey. For some time after starting our path led through a partially submerged valley, covered with tall cyperaceous plants, the hard serrated leaves of which inflicted many a painful gash on our hands and face. Immediately on leaving this strip of swamp we came again to the dry savannah. After walking on this for a few yards, our attention was attracted to a round

white object in the grass, which on nearer approach turned out to be a human skull. Lying close by was a humerus and several portions of the human vertibræ. On enquiring how these bones came there our men told us that years ago the country had been visited by a terrible plague which swept off their people in great numbers. These bones were to be found scattered all over the district—even entire skeletons could be obtained if searched for.

About an hour before sunset we reached our destination, a village picturesquely situated at the foot of the mountains. We were too weary to care for anything but rest, not even wanting our dinner, and we retired at once to our hammock which was slung in an empty house apportioned to us by the old chief. Darkness came on so rapidly that it quite astonished us, but in the morning on leaving our hut the phenomenon was accounted for. To the west of the village towered a particularly high mountain peak, which as the sun dipped behind it cast its shadow on the little valley below and caused the sudden darkness that so surprised us. As soon as the sun had risen sufficiently high to illumine the little settlement we started up the sloping side of the mountain, guided by the old chief to where the eagle had its eyry. Our path was a rough one—at one moment we were climbing over fallen tree-trunks and the next scaling huge lichen-covered boulders. Then came shallow swift-running creeks whose stony bottoms, coated with slime and moss, rendered wading through them almost dangerons. At length we arrived at a gulch between the mountains, a little way up which stood the silk-cotton tree of which we were in quest.

Scattered on the ground underneath were the bones of various animals, amongst which we found the right radius of what must have been a nearly full grown peccary. Here we sat for hours awaiting the coming of the Harpy and listening attentively for the cry of the young one, but all to no purpose; the bird did not make its appearance and the tree was too large and high to be climbed. We were therefore unable to ascertain whether there were any young birds in its hollow trunk. Rain-clouds now commenced to gather, and fearing one of those heavy downpours so frequent in this part of the savannah, we thought it advisable to return to the village, which we reached late in the evening, not feeling in the best of moods at the disappointment we had suffered and the long journey we had so vainly taken. The rain by this time was falling in torrents and for three days it kept us prisoners at "Awarapoota" this being the Macoushi name for the little village. We subsequently learnt from the old chief, whom we had got to distrust, that two moons (months) had elapsed since he last saw the Harpy. Had we known this it would have saved us a long and weary journey,

As soon as the rain ceased a little we gathered our effects together, and returning to Quimatta, were soon drifting down the muddy Rupununi on our way to our home in far off Georgetown.

*Cane Cultivation in the Straits Settlements.**

By F. Campen.

THIS is written from Byrani, a section of the Penang Sugar Estates' Company Limited, in the Province Wellesley, and I only ask you kindly to take into consideration, that I am not an English born subject, therefore cannot express myself exactly as I ought to, neither am I such an experienced writer on cane cultivation *cum annexis*, as some planters of Demerara, and also that I am very sorry for having to tell you beforehand, that you will find very few figures or statistics, which are usually found in connection with this kind of work, for the simple reason, that I am only a practical man and my education is not up to this standard. The working of the cultivation hereafter described by me, is almost the same as is in use on all the other estates in Province Wellesley, and I can assure you that it is really a magnificent sight for a planter fresh from the West Indies to come here and have a look about him; and what strikes him mostly, is the fact that all the smaller as well as larger canes have a drill between each canerow, also the larger ones, which in other countries would be lying down, are to be found here standing straight in the air. The reason for this is, that the cultivation here is worked quite differently from that in Demerara in many ways, as for instance the canes are banked here, which system I will describe to you a little later on, as this is

* Read at the April Meeting of the Society.

the main point in the cultivation here and such a good one, so easily adopted, so labour saving and so much less expensive than the old style of Demerara, that it is really worth the thought, to give it a trial. There is no great knowledge required to do this banking, as it is called here, and the advantages gained by doing it are so many, and it is so superior to any thing I ever have seen in the way of cane cultivation, that I shall try my best to give you a clear insight and a good description of the same; at least, I shall make an attempt to do so and hope only that I shall be successful.

Gentlemen! I see you smiling, when you hear about this wonderful cultivation and the banking system, but as a practical man, I know this to be only too true, and I shall leave it for you to decide if I am right or wrong, after the whole of the system has been explained. I certainly must own, that, when first arriving in the Straits settlements, I myself had a very poor opinion of it, but now, after having seen it worked and its effects on the canes, I have come to the conclusion that it is a first rate arrangement, and I flatter myself to be able to give an opinion on the subject, having been for over twenty years a planter in Demerara as well as in Surinam.

This Banking system, I beg to state, is not only good for the cultivation, but also, when once established, good for the pocket, as it is really less expensive than the style of working in Demerara, and with the low price of Sugar at present, I have no doubt that anything which is cheaper and just as good, if even not better, would be only too welcome to any planter or proprietor of a Sugar Estate.

In this far-out-of-the-way place, I have read in papers which occasionally fall in my hands, that the prospect of the cane cultivation at present in Demerara is very gloomy, for which reason, I would like to draw your attention to this Banking system in use here, as I am of opinion, it could be easily adopted in Demerara, and worked there with perfect satisfaction; it would also bring down the expense of cultivation to a very low figure.

The System comes from the Chinese, who are well known to be great cultivators of the soil, and it has really many advantages over the old style of doing things, and some of these advantages, I shall now proceed to enumerate, viz.

1. Better tillage of soil.
2. Better drainage.
3. Better adapted for drought.
4. Less grass.
5. Less rotten canes.
6. Better cane juice.
7. Less labour required.
8. Less expensive.

With the Banking system or something similar to it, if once adopted, some of the more expensive items in the Demerara cane cultivation, like "New cane rows," "Drilling," "Burying trash," "Forking banks," etc. etc., would be done away with, and anyone who has been a planter of some years standing, knows what that means and what a difference it would make as to expenses. The only drawback against this system in Demerara would be, in my opinion, that you would be unable to get any "blacks" to work at it; as it would be for them too straining, or as they would call it, "too labori-

ous." But with an estate having a large gang of Immigrants, this would be a matter of indifference, I venture to say.

The instrument used here, to do the Banking and almost all our work, is a strong and heavy hoe (stronger by far than a shovel) with a short handle of 2½ feet long; Chinese use the long handle, our Coolies, the short one of 2½ feet, and beside this hoe and a short caneknife, there are hardly any other implements used. The shovel and shovel spoon are also unknown. We have got some forks here now, but they are mostly used for digging out a kind of devilish grass, called "Lallang," which is much more destructive to cane cultivation than "Para grass," "Bahama" or anything of the kind known to the planter of the West Indies.

The Banking is on the same principle as the Fork or Shovel moulding in Demerara, when it is intended to replant the following year, only it is done here on a much larger scale, and it can easily be done by an Immigrant according to his own fancy, either with the shovel, should the soil be hard, or the hoe, should it be of a fairly loose kind. The most noticeable difference which exists between the two methods of Demerara and here is, that there is no ploughing about and around the cane stools before the earth is put on, which is generally the case there. I must also not omit to mention, that no proper Banking can be done, if the cane-rows are less than six feet apart.

I shall commence now to describe the actual working of the cultivation, and especially the Banking, which to make intelligible for you, will be for me, what is called "A tough job," but, as my motto is "Never say die," I

shall commence in the first instance with a newly empoldered field, which is going to be taken in and added to the cultivation.

My description of all this will be of course the way it is done here, but at the same time I might mention, that all the work done here with the hoe (our soil being for the most part of a loose kind, although there are several fields on this place with as hard a soil as I have had to deal with when in Demerara) nothing could prevent the same work being done in British Guiana by a combination of shovel, fork or hoe.

The field, having been cleared from trees and bush, and the grass burned off, the canals and drains dug, is ready for the Men gang, who arrive on the spot and hoe it all over a foot deep, also levelling at the same time every thing as much as possible, and cutting away any roots, grass, bush, &c. left by fire. After this is done and the cane-tops transported to it, the Planting gang comes to the front, and as the field is not, as in Demerara, lined, or cane-rows made beforehand, the men stretch two lines with a stick at each end right across the field: a six feet stick separating the two lines. After this is done, the men stand along the lines about 20 to 30 feet apart and make with their hoes, what goes in Demerara by the names of Cassava holes, each hole being 18 inches apart, wherein they plant two cane tops, which tops were previously especially assorted and dropt over the field, in rows of six feet apart according to judgment, by separate men. Whenever the men along a line have finished making holes and planting, the line is shifted forward and the same work commences again, and so on until the field is finished. I might mention at this moment, that the

task for 40 men is to plant in this way 10 acres per day.

Generally, all the tops come up very nicely and very little supplying is required.

Whenever the field gets grassy it is weeded and heavily moulded at the same time, and then given time to grow, until the general stand of canes is from about 3 to 4 feet high, when the time has arrived to give it the first Banking, which is done as follows :—

The men go to the field and each of them takes a row, which he weeds and very particularly takes off all trash, especially all the small leaves on the bottom of the cane-stools. After this, with a dry cane-blade, he ties the bunches together in such a way that each cane-stool is separate by itself, and after having done this, he takes the hoe and makes a drill between the cane-rows, doing this in such a way that, when lifting the earth, he places it around the canes, taking care that every thing is even and the work when finished has the look, as if a shovelman in Demerara, had been digging a drill, a foot deep by a foot broad, with the difference however that instead of having thrown the earth on the so called trash-bank, he has spread it all over and about the canes, covering everything slightly from canerow to drill. When so finished this will give you a cane-row or Bank, as it is called here, with a kind of rough drill, of a foot by a foot, on each side of it. As to the drills, no particular neatness or paving is required, as long as they are well in the middle and have the required depth and breadth.

One advantage of this work is, that in the rainy season a drill being on each side of the cane-rows, no fear need

exist as to drowning out, as I have seen happen sometimes in Demerara and there is also another advantage, that in the dry season, a field, in this kind of way established, can easily at any time be flooded, which would be of great consequence sometimes.

Nothing more is done to the field now until the canes, after a couple of months, have grown a little more and so to say have from 4 to 6 joints, when the same performance is gone over again, only with the difference that the labourers, when taking out another foot of earth from the same old drill, pack it on and between the cane-stools and press it down and against them with their feet, so that in time to come, the canes have something to support them and are able to grow upright.

The appearance of this last work or Bank, when properly finished, must be something similar to an umbrella or the hut of a Zulu, and the more earth that has been put around and between the stools, the better it is; also the distance from the top of the earth packed around the cane-stool to the bottom of the drill, must be not less than $3\frac{3}{4}$ feet.

I also must not forget to mention, that the labourer, every time when he has finished with his first or second Banking, is obliged to unloose all his tied up canes, which were only tied up so as to give him more room, and not to be any hindrance to him in the performance of his work.

The advantage of this second Banking is, that the canes are obliged to grow straight up, very seldom tumble or lay down, except owing to a very powerful wind or hurricane of an exceptional length or anything similar; are therefore not so liable to be broken in the trashings, there are less

rotten canes, and the drills are very useful for receiving all the trash afterwards, which being on each side of the cane-row, makes this work for the labourers so much easier; they can therefore do a much larger amount of work than otherwise, and they also need not to be paid as much for it as if they had to work according to the old style of clean trash-bank. The drills also, notwithstanding the trash in them, are still very valuable both in the rainy and the dry season; both sides of the cane-rows being covered by trash, they not only keep down the grass, but also keep the ground cool and moist for the roots of the canes.

Then again through this second Banking the subsoil is brought to the surface, without doing the least harm to the canes, and gets mixed the following year.

There are still some more advantages to be mentioned, but they will explain themselves in the course of my writing, as " 'deed faith," the real benefit of the Banking comes only after the canes are cut.

At this instant, I should like to mention, that, if any one in time to come be desirous of giving the Banking system a trial and wish for more information on the subject, he has only to write and I will give it with the greatest pleasure and to the best of my ability.

The weeding and moulding and trashing are done here in the same way as anywhere else, therefore I have nothing to say about them, and will now proceed with the cane-cutting, which slightly differs from the Demerara style, and has several good points about it, which will recommend themselves to any planter of any country where the transportation is done by water.

No cane cutting is done with the cutlass here, as the canes are too heavily moulded or banked, as you

must know by this time, and cutting them with the cutlass, would leave too much of the cane in the ground, for which reason, it is done here with the same everlasting hoe. Of course it could be done also with the cutlass, if a little cane would be of no consequence, but, as to the question of how much Sugar would be left in the ground per acre, when done in that way, I leave some one else to calculate.

When going to cut canes, each takes a row and commences cutting down the canes with the hoe, as deep as is possible for him to do; at least it is expected from him. Then, after he has cut down from 10 to 20 canes, he takes his short cane-knife and cuts off the tops. Between two men, they give a clean drill for receiving the cane-tops. He then ties his canes in bundles and not with "One" band, as it is the custom in Demerara, but with "Two" (the bands being about 2 feet apart) and carries them out on his shoulder to the parapet, where he piles them lengthwise, as near the Canal as possible, without any falling in the water and also without his removing the bands from bundles. He is expected to tie up in bundle from the very first cane he cuts, and is fined if it is found out that he has not done so. By this you will see, that the throwing of canes as in Demerara is unknown here, and the benefit of the two bands on bundles is considerable, as you will see shortly and must recommend itself to any planter, as canes not thrown loose on parapets, but piled on them in bundles, give very few water-canes, also the punt loading is made much lighter through this, and whenever it is the intention to stop grinding on estates, there is very little trouble in the way of trash-turning, backing

of canes and so on; in fact no delay whatsoever. One or two men are generally sufficient to do all the water cane-picking on a large Estate here and also would be, wherever the canes were not cultivated in our fashion. Then again, where things are done according to our style, there is no hurry, no worry for the punt-loading overseer; who could afford to play lawn tennis during the day, should he feel inclined to do so, and at night, instead of flying all over the show like a nightfowl, can afford to sleep the sleep of the just. Just think, what it would mean to you, to be free from those horrible "water-canes," "stale canes," "glucose," "bad sugar," bad language from the Manager, Attorney, etc., etc.; this alone, I should think, ought to be sufficient reason for any one adopting our style of business. "Blacks" of course would be scarce where this would be attempted, but you have your immigrants, who, I am sure would readily and in no time come to your way of thinking, if in the beginning, you were to give them a little more for the work: as a few cents more and a "little bit of sweet mouth," goes a great way with them: at least, that has been my experience with them of old.

The punt-loaders, when sent to load canes, lift the bundles from the parapet into the punt and pack them there in three sections or even heaps; beginning always from the head and so on in rotation. They are not permitted to load otherwise, as then they would try to cheat (every trade having its own tricks) as by filling both ends of the punt first, they could manage to put only a few bundles in the middle and cover up nicely, the same as I have seen done with loose canes in Demerara.

The punt-loaders also, have to leave at each end of the punt from 3 to 4 feet space, so that in case of rain or a punt sinking, there is room enough left for some one to get at it and bail the water out. This is also a very good arrangement and saves much time, trouble and vexation. Demerara cane-cutting and loading is very well in its own way, but I think our style is to be recommended, and the fact that the same is much better and superior in many ways, if well looked into, can hardly be denied by any one who knows something about these matters. I might mention one of the most important advantages which occurs through our style, which is, that after the canes have been brought to the Mill and lifted out of the punts in almost straight bundles into the cane carrier, and are drawn up in that way to the rollers, they allow through this not only the mill to take a much better and larger feed, giving therefore better crushing, but also to do a greater amount of work than otherwise would have been the case with the old style of loose canes. A man on each side of the cane carrier is employed to cut loose the bands or bundles when passing him, before their falling on the rollers.

This tying up of canes and transporting them in bundles, I have no doubt, would be also a splendid thing for the diffusion estate; where I have to inform you I have served on them for some time, and I know what it means to pick up loose canes for a spell of twelve hours without stopping and to throw them into the hoppers. I am certain that the machinery could do more work, if there was the same way of doing it as here and the work itself would be at the same time not half as much felt by the men employed at it, as all that would be required

to be done, would be to give each man standing round the hoppers a sharp knife, so that he would be able to cut quickly the bands from the canes and throw them away, when the canes are in the act of being drawn down the carriers.

At the moment I cannot remember anything more that would speak in favour of our cane cutting and loading.

As for our transportation, here I am only too sorry to inform you, that this is very inferior to anything I ever have seen before in that line, as here mostly a set of slow, stubborn and lazy buffaloes are used for that purpose; who crawl along at their own time, so slow, as would no doubt make a saint swear sometimes. We have got also a few mules now but they are like a drop of water in the sea.

I might mention also, that by canes being loaded in bundles, not so large punts are required; a Demerara iron punt for instance, I am sure, would hold in that way at least from 4 to 6 tons of canes.

Whenever all the cane cutting of a field here is finished, women are sent, who pick and carry out all the tops, which they collect in heaps on the parapets, at about 20 roods apart, which they cover up with trash, so as to protect them from the sun until required. Whenever, this is the case, experienced men are sent, who pick out only the good ones, and I must say that this style is much to be recommended, as it keeps cane-tops good for a long time; prevents also bad tops from being planted; therefore there is less supplying and re-supplying, less disappointment and vexation and less money wasted.

There are three items in the working of our cultivation still worth mentioning and to be brought to your notice, especially two of them, as they are in direct connection with the Banking system and will prove a little to you the benefit of the same; namely the Ratooning and Replanting. I shall commence with the first mentioned and try to describe it.

When it is intended to ratoon the field, the spring of some being all that could be desired, the men are sent, each of them taking two rows, and after having, as much as possible, equally divided tbe trash between the drills along the cane-rows and properly rammed it down with their feet, they take their hoes, standing sideways on the trash in the drill facing the cane-row and chop or dig from 6 to 8 inches of earth from the top of each Bank, (leaving at the same time 4 inches of earth right round each canestool, intended to be a brace for the stool, when they trim it later on) which earth they put on the trash. Having thus taken the earth from the Bank on to the trash, it naturally leaves the stools sticking out, which the Labourer now remedies by making a clean cut with his hoe and trimming them level to the earth. There is no fear of the stools getting too much shaken or split, for the brace of 4 inches of earth previously mentioned, prevents this also. After the work is finished, there is still plenty of the stools left in the ground, which you will understand when remembering what an amount of earth was put on and around the stools during the second Banking. This is a cheap, good and quick way of getting rid of your trash, allowing the stools to have a good spring, and also valuable, as by it the subsoil, which was put on by the second Banking, gets mixed.

No stop-off can exist in it and the trash, laying in these deep drills, where is generally a considerable amount of moisture, even without rain, gets rotten quick and is of great benefit as a manure, when in a couple of months afterwards, it is put on the cane rows again by the first Banking.

I may mention also, that if at any time it should happen after all that the spring does not turn out to be as good as was thought at first, it would not be so very hard work, to haul the trash again out of the drills, to put on the old cane rows and save one-self by converting the drills quickly into new cane rows and replant.

When replanting is intended, the trash is burnt first (which can be done here at any time, as the tops are always picked and collected in heaps) and then, all that is left improperly burnt, is put by the men on the old canerows, who after having done this, chop with their hoes the drills (made by the Banking) and widen them to the required breadth. No lining is required and it is quick and very cheap work. Of course from a Demerara planter's view it might not be exactly fanciful work, but the question is, whether that is necessary to make canes grow?

Our planting or supplying is the same as in Demerara, with the exception that it is done here with the hoe, instead of the shovel or cutlass; also with the advantage that only carefully picked cane-tops are made use of.

After a field is replanted, the stumps, which grow up after a while in the old Banks, are dug out as useless by the women gang with their hoes, who at the same time give a slight moulding to the plants. This work is

called Breaking Banks and sometimes in hard soil it is rather hard work.

I must also inform you, that in this part of the world no use is made of any stumps whatsoever; as the tops generally grow so good that they are not required, and I have seen field after field of stumps dug out (as it pays here better to replant, made so easily and cheap through the Banking) which sight I am sure, would have made the heart of a Demerara planter bleed.

This is about all that I have to say and can write about the cultivation here, and to my thinking, it must have been by this time enough for you. All I wish to say is, that the working of a cultivation here, is most simple, cheap and answers to all purposes. The Banking has a great deal to do with this and if I inform you that we are here perfectly free from grass, have a splendid stand of canes, a cultivation of 1900 acres and that our daily Outturn of Weeders consists of about from 150 to 180, also that such a thing as Task Gang Weeders or anything similar is unknown in this part of the world, I dare say that you will concur with me that there certainly must be something in this Banking.

Planting, Replanting, Supplying, 1st Banking, 2nd Banking, Breaking Banks, Weeding, Moulding, Trashing, Digging Canals, Sidelines and Drains, and picking tops are all the items here in the cultivation of a sugar estate.

I shall give you now the several Tasks of the different works and the money paid for it; just to give you an idea. The Money, I quote in Demerara currency for convenience sake. You will find the money very little, but you must know, that we get our labourers mostly from India, where natives are accustomed to work for

little or nothing. Also rice and other articles used for food are very cheap here, and clothing is very little required. "ADAM and EVE" would feel themselves perfectly at home here.

THE "TASKS."

Planting by the day 40 men to 10 acres per day at 10c. each.

Replanting	do.	do.	do.	do.	
Supplying	do	do.	do.	do.	
1 Banking	600 ft. for 18 to 20c.	task	400 to 600 ft.	$2 16 to $2 40 [per acre.	
2 do.	600 „ „ 20 „ 24c.	„	300 „	$2 40 to $2 88	
Breaking Banks	600 „ „ 8 „ 9c.	„	600 „	$ 96 to $1 08	
Weeding or Weedings M.	600 „ „ 3 „ 4c.	„	1200 „ 1800 „	$ 36 to $ 48	
Trashing	600 „ „ 3		1800 „ 2400 „	$ 36	

All our water work as canals, drains etc., is rather dear, as it is mostly done by Chinese, but about half the price paid for it in Demerara.

There are some more things worth writing about, as being interesting and connected with our cane cultivation, but I think, I shall leave them for another time.

A Journey to the Summit of Roraima.

By J. J. Quelch, B. Sc. Lond., C.M.Z.S.

THE summit of Roraima, the frontier table mountain between British Guiana, Brazil and Venezuela, has been for years the cynosure of all the chief explorers in the interior of Guiana, its lofty, vertical-walled sides presenting an apparently insuperable obstacle to its ascent. Traveller after traveller had climbed its sloping base only to be stopped by its precipitous sides, until in December 1884, Messrs. IM THURN and PERKINS made their memorable ascent by a broad ledge on the south-western face. Unfortunately, however, they had been unable to remain more than an hour or two on the summit, nor did they find any later opportunity for its further exploration. Various orchid collectors who have since then journeyed to the mountain to collect the rare and lovely *Cattleya Lawrenceana,* which up to the present has only been found in that neighbourhood, have made ascents by the same south-west ledge, but have contributed practically nothing to our knowledge of its topography; and speculation has been almost as rife as formerly as to what might be discovered on the summit plateau when really detailed examination was made.

For many years, it had been my desire to undertake an extended collecting expedition to the Great Savannah for the benefit of the Museum under the auspices of the Royal Agricultural and Commercial Society, but it was not until July last year that such an expedition became

possible, at the same time affording opportunities for an extension of the trip to Roraima on the one hand, and to the Takutu River and the Kanuku mountains on the other. The party included Mr. F. V. McCONNELL, who shared expenses with the Museum, Mr. A. LENNOX, Mr. C. A. LLOYD and myself, with two taxidermists, and a mixed following of two or three black men and Indians who numbered on an average about 35.

It might perhaps be mentioned here that the journey to Roraima really began from the Makusi village Kwaimatta, our central depôt on the Lower Rupununi savannah, and that therefore only the briefest reference will be made to the antecedent travelling along the Essequibo river. The brothers SCHOMBURGK, BARRINGTON BROWN, and FLINT and EDDINGTON, had made their visits to Roraima from different parts of this same savannah, but by three very distinct routes; while the usual course direct from Georgetown had been either by the Mazaruni or the Essequibo and Potaro Rivers. These latter, however, though comparatively much shorter than the roundabout savannah route, have this serious disadvantage, that it is nowadays a matter almost of impossibility for a large party to procure sufficient Indians from the district as carriers, while, on the savannah, carriers can very easily be obtained. Probably it would be found that where there is much baggage to be dealt with—as necessarily would be the case in any expedition undertaken for scientific purposes—as much time would be taken up in the getting and waiting for carriers on the shorter, as would be spent in travelling along the longer route, while the expense would certainly not be less, and the worry and anxiety very considerably

more. Carriers from the coast are certainly not to be recommended.

Leaving Georgetown on the 7th July, LLOYD and I made the start from Bartika on the 9th, with four boats, two of them having been kindly sent down by the Rev. F. W. B. DORSET from the Indian mission station of Waraputa, where our temporary depôt was to be made while the Kaieteur Falls was visited. MCCONNELL and LENNOX joined us at Komaparu, having journeyed along the Demerara river and thence overland to the Essequibo landing. With the exception of the swamping in the rapids of Korowabo, of one of the boats, a large built-up Indian corial, which had already given us a great deal of trouble through leakage, and which being almost empty at the time only entailed the loss of a skillet and a few paddles, the journey to Waraputa was accomplished without serious casualty, though owing to the high water, and the very strong current, it was considerably protracted. On reaching the mission station, the extra boats were paid off, and the luggage stocked; and with a double crew in our large bateau, *Victoria*, we started on the 21st July for the Kaieteur Falls.

The object of the journey to the Kaieteur was not only to see the Great Falls in flood, but to find out what chances there might be of communicating with the Roraima district through the Indians at the head of the falls, where there had been, at the time of Mr. IM THURN'S journey, the settlement of Chinebowi. We hoped that by making arrangements with the people of this village, it might be found more expeditious to transmit letters by this route to the coast when we had under-

taken the Roraima extension of the expedition; but unfortunately the village had been deserted for some time. The large mission station too at Ichowra had been abandoned for some years; and a striking change was to be seen just below its site, where a large number of waterside gold camps formed a picturesque settlement of no mean size on the elevated right bank of the river.

The Kaieteur ravine and the Great Falls have so often been described that it would be unduly taxing the patience of the reader to dwell upon the beautiful pictures constantly unfolded to view. By one, however, who had previously made the trip in the dry weather, as I had done in 1889,* the contrast now in the rainy season was one that could scarcely be passed over without comment. At the various rapids and cataracts, where, when the river was low, vast quantities of rocks and tree-clad islands of all shapes and sizes, and great banks of variously coloured sands, broke the monotony of water and forest, there now stretched lake-like expanses from one bank to the other; while from the steep escarpments of the ravine, several hundred feet in height, cascades of purest white here and there leapt down, foaming and swelling as the rains descended, contrasting against the environing rocks and forest as though some fairy magic had cast its glamour on the scene.

The Great Falls in the dry weather had been inexpressibly grand and beautiful, but now it was vaster and grander. Then, a great curtain of water had rolled over the middle of the bluff, broken up and dissipated into rain drops and vapour on the western side ere it reached the bottom, but on its eastern side falling in one

* *Timehri*, Vol. iii. New Series, p. 132.

continuous shimmering mass into a wide pool, the waters of which were thrown up as in a seething cauldron, and, in spite of the frequently ascending clouds of vapour, were distinctly visible from the edge of the bluff. Now, the whole base of the fall was impenetrably veiled by ever rising mists and vapour, into which disappeared, several hundred feet below, as to an infinitude of depth, the enormously great volume of water that covered the bluff and extended to the trees marking the high water line on both banks of the river. The view was thus stupendous; but what it had gained through the heavy rains in amplitude, it had lost in beauty. The superabundance of mist and vapour, though it added immeasurably to the perception of weirdness, yet altogether obscured the definiteness and completeness of the outlines of the falling column. It was noticeable too that since 1889, a very large portion of the upper edge of the bluff, almost from the centre to the western side, had been washed away, thus giving a marked unevenness to the fall at this side, where indeed the water rushed down a step-like incline before making its enormous leap, with tints contrasting sharply throughout its fall with those of the eastern side of the column.

During the trip in the Potaro, the weather had been of the most unfavourable kind for collecting purposes, the rain descending in deluges at frequent intervals; and our food supply had become low: we therefore made a hasty return to Waraputa, whence, after procuring large quantities of cassava bread, we started on the 1st August in the bateau *Victoria* and the little despatch boat, both heavily loaded, for our intended depôt on the savannah, About one-fourth of our effects

was stocked at Waraputa, to be brought up on the later trips of the despatch boat.

For the next three weeks, until we had passed Rappu, the journey was almost a constant struggle with cataracts and rapids, which succeeded each other at close intervals, the surrounding country being mountainous, with numerous connecting dykes across the river; and even where usually there are smooth stretches, the high water and heavy current rendered it a continuous and most arduous labour, the more so from the fact that five out of our thirteen hands in the bateau were almost constantly sick and incapable of work. We were thus frequently reduced to "monkey-jumping," as it is called, pulling up the boat for long distances by hauling on the bushes and trees along the waterside.

The rapids and cataracts of Haiawa, Twasink, Itonimi, Komuti, Uropokari, Kuratoka, Pishani, Akra-mukra, and the Gold Falls in particular, had cost us tedious and severe labour; but the mountain masses, especially at Komuti and Makari, had given us delightful pictures of sylvan river-side scenery at the obstructions, more especially where the river had widened out into great lakelike and island-dotted expanses, surrounded by the forest-clad slopes of the amphitheatre of hills, resplendent in their ever-varying hues. The great height of the water had evidently been unfavourable for the flowering plants, though towards the higher reaches, as in the vicinity of the massive rocks of Akra-mukra, the brilliant flowers of *Cattleya superba* had rivetted our attention.

Interesting samples of animal life had also been scarce. True at Konawaruk, we had caught a living specimen

of the rare green tree-boa *(Xiphosoma caninum)* on the low bushes by the waterside; while at Haiawa, we had secured our only specimen of the deadly bushmaster *(Lachesis mutus)* coiled up extremely close to the path by our camp; and, at the Gold Falls, had shot a large labarria *(Trigonocephalus atrox)* while boring our way through the dense bush along a side channel: but there had been little else, and even our Indian huntsmen had met with but very indifferent success in procuring game.

Of cassava and other provisions, we had scarcely obtained any. At Moruwa, a Wapisiana settlement above Komuti, we had bought a few yams, but the large settlement of Post Arinda had been long deserted, and grass and bushes had almost taken over the place. Here, and at a few other deserted settlements, the men collected a few limes, papaws and some sugar-cane; while at Simang, above Makari, but a cake or two of cassava could be got. Our supplies therefore were sensibly diminishing, and even the stunted wild pines by the river-side above Rappu were welcome.

On the 26th we reached the mouth of the Rupununi river, and camped at the landing of a small Indian settlement, which was all that now remained to recall the famous old Karibisi settlement of Apoteri, situated just above on the Essequibo. Here we rested for two days, sending back the small despatch boat with letters, to rejoin us later with stores from Waraputa before the start should be made for Roraima. Here too we obtained a welcome supply of fresh provisions.

The remainder of the journey to the landing at Kwaimatta which we reached on Sept. 6th, was accomplished more quickly. No rapids obstructed this part

of the low-lying Rupununi, which wound its tortuous course through the great plain, south of the boldly abrupt massive peaks of Makarapan, and by the rounded grassy slopes of the mountains of Annai and Mora. Our sick paddlers too under the influence of better weather had resumed work. They had been able at the various settlements, such as Simeri, Sikui, and Itaki on the Rupununi, and the Atorai Indian settlement by the mouth of the Rewa river, to procure small quantities of cassava, yams, plantains and other fresh provisions; and opposite Annai an abundant stock of wild pines from the savannah; and altogether this had tended considerably towards their convalescence.

Our advent to the low-lying and almost wholly swamped country was unfortunately signalised by an abundance of mosquitoes and sand-flies which gave us but little peace, though the plague was nothing like in severity what we had been led to expect from the accounts of previous travellers. These pests certainly were plentiful, but other forms of life had been remarkably scarce, and at the various camps where we had attempted systematic hunting, but very poor results had been obtained. Our supplies had become considerably reduced on the long journey, while our collections had been altogether unimportant.

From the point of view of labour, we had reached Kwaimatta at a particularly opportune time. The night before there had been a large paiworri feast, and as was customary, the Indians had collected there from remote districts. We thus not only had a very large company to assist in portaging our abundant baggage from the landing to the village, which was situated about two and

a half miles inland on the savannah, and a few miles above the Bononi creek on the left bank, but our advent and our needs were effectively advertised over a very large area. Large quantities of provisions were by this agency brought to us to Kwaimatta, where indeed food, other than cassava, was by no means plentiful or easily obtainable; and other Indians who had heard of our intended journey to Roraima came in to offer their services as carriers.

It had been our original intention, after stocking our goods at the village, and while awaiting the return of the despatch boat with supplies and letters, to start at once on a short expedition to the Brazilian frontier, and onwards to Fort St. Joaquim; but the heavy flooding of the savannah induced us to abandon the attempt. LENNOX too was quite prostrated by severe ulcerations on his legs, which rendered such an expedition impossible for him, while the discomfort of an attack of ground-itch on my feet made me desirous of getting rid of it by complete rest ere the Roraima journey was undertaken. Later, in December, the trip to the Brazilian frontier and the Kanuku mountains was made, and we discovered then that the September attempt would have resulted in failure, for even in the depth of the dry weather, the valleys in the open undulating savannah were still covered with water, and were really only muddy swamps.

In the meantime there was a good deal in and around Kwaimatta to occupy us, though owing to the sandy wastes and the floods and swamps, it was by no means the most desirable place either for residence or for collecting. Still it was the most populous and the most

central for our purposes, and we therefore bore with resignation the ills incidental to the place. Sandflies and mosquitoes were at first plentiful, and owing to the presence of three head of cattle about the village, cow-flies of large size and persistent habits worried us whenever the cattle strayed in the neighbourhood of our house. But the water supply was our most serious trouble, for all the available water was taken from a series of holes dug in the shallow swampy valley which lies around the slight elevation on which the settlement is placed, and which thus receives its drainage. In certain of these holes, the people bathe: from others, water for drinking and household uses is taken; but practically there is little distinction between them other than that certain holes are more or less undisturbed and clear. So abundant were the little fishes in these pools, that frequently the gourd vessels which are always used in carrying and storing water, enclosed several of them, and in drinking from our dark enamelled tin cups, we frequently ran the risk of swallowing one or more of the little creatures. As the dry weather advanced, the water became more or less malodorous; and we were obliged to send more than two and a half miles away to the river for our drinking supply. It seems to me beyond doubt that much of the sickness among these people in the dry months, when atmospheric conditions should be the most suitable for them as regards health, is due to their entire lack of sanitary precaution in water supply, as well as in other matters.

In the life of the people, who are of the Makusi tribe over this portion of the savannah, there was a constant source of interest for us. Small parties of them were

always coming or going; and of the thirty large houses and sheds that compose the settlement, about 18 were more or less constantly occupied. The population thus fluctuated considerably between 100 and 200, though the numbers increased rapidly on special occasions, as, for instance, at Christmas when there must have gathered about 1,500 people from all the villages and settlements around, even from a radius of more than 50 miles. The houses are chiefly of an irregular oval shape, shut in with wattled clay sides, the roof being thatched with palm leaves brought from a long distance up the river; and they are disposed in a very wide circle about a central building set apart as a "church," though concentration is made on the North and South sides of the circle where several houses are built closely together in a wing. The enclosed space is kept clear of grass, and forms the chief play-ground of the children. By constant burning in the dry weather, the grass on the surrounding savannah is kept comparatively low and soft, and it furnished excellent food for the three cattle which were in remarkably good condition.

Immediately around the village, the undulating grassy savannah stretches, broken here and there by low bushes and straggling clumps of *Curatella americana;* while on the north-east, where a high barren sandy ridge extends towards the river, there is a denser growth of many other stunted trees. Among these are scattered numerous groves of the cashew *(Anacardium occidentale)*, from which in their season large quantities of fruit add to the food supply of the settlement. Cassava alone is grown to any great extent in the fields, which are situated a few miles away; but pumpkins, sweet potatoes, melons

and corn, judging from those produced, seemed equally well adapted for growth. Yams, plantains, bananas, and pines, are only obtainable from distant districts, such as the settlements of Annai, Mora, Simoni and Waipokari, where many general residents of Kwaimatta own fields, and whither they occasionally resort not only for additional ground provisions, but to obtain fish and game, which are scarce or hardly procurable around Kwaimatta.

Beyond its central position, for which no doubt it had been selected as the site of a settlement, there is little to recommend the situation of Kwaimatta. Its distance from the river, its bad water supply, its scarcity of provisions owing to the unsuitability of the surrounding lands, and the pests of mosquitoes and sandflies over a great part of the year, are all disadvantages; still it forms the most suitable depôt for the traveller who desires to become acquainted with the people and to select bearers. Waipokari, which is situated about 30 miles further up the river, presents many more favourable features, but it lacks the central position.

As a depôt in the dry weather, the settlement is pleasant enough. A strong, cool breeze blows regularly over the savannah, and although the thermometer registers 90°–92° F. in the shade during the day, the effect is less apparent than on the coast; while towards morning a temperature of 72° is very distinctly cold. In the latter months of the year the temperatures are lowered by about three degrees.

The natural surroundings are also interesting; and from such a vantage-ground, situated on a slight elevation on the savannah, with extensive views in all directions, one enjoys them to the full, more especially after a cramped

journey in a boat through the apparently interminable forest that stretches almost unbroken from the Lower Essequibo river right upwards along the Rupununi to the southern spurs of Makarapan. About 15 miles to the North of the village, the rounded ranges of the mountains of Annai, Mora, Warushi, Irriwang and other points, extend, running westwards to the Ireng river—almost wholly grass-covered, but frequently broken by patches of forest, the lights and shades on which, at different times of the day, are exquisitely beautiful. On the East, the bold outlines of the Makarapan mountains, intensely blue with haze, rise sharply against the sky, with a line of forest in the foreground marking the course of the Rupununi river. On the South, the long range of the Kanuku mountains lies almost on the horizon, often hidden by mist and haze; while to the West, the undulating savannah stretches away and is lost apparently in an infinitude of distance.

In such surroundings we spent more than a month awaiting the arrival of our despatch boat, and preparing ourselves for the long and arduous journey that lay before us to Roraima by walks in all directions, collecting whatever desirable specimens came to our hands. Chief among these were Swainson's kite *(Gampsonyx swainsoni)*, and the little kestrel or windhover *(Tinnunculus isabellinus)*—called respectively "Kome-twi-twi" and "Ki-ri-ri" by the Makusis—both of which seem to be only obtainable in these districts. Chief among the desiderata were the largest specimens of the Caiman *(Alligator niger)*, and the great Arapaima fish *(Sudis gigas)*, which have been described by former travellers as ranging to 20–25 feet

(WATERTON even stating 30 ft.) in the case of the former, and to 15–17 feet in the latter species. Several specimens of these creatures were seen in the lake-like expanses of the river—known as "Kirahahs"—but owing to the height and extent of the water, it was out of the question to get them. Later on, after the return from Roraima, we were fortunate however in procuring several specimens of each, and though in the water they could readily be imagined to be of the lengths ascribed by former writers, it was found by definite measurement that the largest of their kind—recognised to be such by the Indians themselves—were considerably under the apparent size given, and that the Caiman is at its maximum between 12 and 13 ft., and the Arapaima at 8 ft.

In the meantime, three of the traders who deal regularly with the Indians on the savannahs, exchanging barter for hammocks, balsam copaiba, macaws and parrots, had arrived at the village, bringing news from the Coast; and one of them, our remaining stock from Waraputa. A gold prospector too, who had been travelling on the Rewa and Kwitaro rivers, also visited the settlement, and reported the finding of alluvial gold in paying quantities on the upper reaches near the Kanuku Mts.; while, just before the arrival of our boat, the Revds. F. W. B. DORSET and F. S. PRINGLE came up from the Waraputa Mission with the object of reporting on the advisability of re-establishing a mission in the savannah district, where, many years ago, such a station had existed.

There can be no doubt that such a mission would be extremely popular among the people, and that under the

direction of a suitable man who would take charge of them temporally and industrially, even more so perhaps than spiritually, it would be productive of much good. From their absolute devotion to "Church," the savannah Indians would be swayed by a parson infinitely more than by any other teacher, and would be likely to listen to, and profit by, that teaching in things temporal which they so sadly need in their simple and primitive life.

On the 5th October our men arrived, their delay having been caused by repairs to the boat which had been damaged while running down the itaboo at the rapids of Itonimi, though not so badly but that she had been able to make the journey to Bartika. On the 11th, everything was ready for her return, and she was despatched to bring back extra stores to meet us on our arrival from Roraima. Our course was now clear for final arrangements for our long journey.

During the last month, attempts had constantly been made to familiarise the people with the idea of the journey to Roraima. A party of Arrekuna Indians, 10 men and 3 women, had appeared, and had engaged themselves as carriers, soon after our arrival; and as the greater number of them came from the neighbourhood of Roraima,—two of them indeed claiming to have been on the summit with KROMER, the last orchid-collector at the mountain,—we considered ourselves very fortunate. True they did their best to alarm us about the distance, the difficulty and the dangers of the way, but the object of this was clearly to frighten the Makusis, and to increase the promises of pay for themselves. The long waiting for the arrival of our boat had been a great trial to them, and but for their intense craving for the guns among our

barter, it is doubtful whether they would have remained so long. A sad disappointment was in store for them, however, as well as for ourselves, for one after another they got ill, and out of the thirteen but five were able eventually to make the start. Among these, fortunately, was one of the two who had been to the top of Roraima —"SCHOOLMASTER" was his name he told us—who, though ill, was induced to make the attempt by promises of special reward.

It was natural perhaps that they should blame us for their sickness, for, as they complained, if we had started when they first came, they would all have been well; and certainly we had been much struck with the robust frames of the greater number of them at their advent. Of the sick ones left behind, we found on our return from Roraima, that one had died, while three others were still extremely debilitated from fever and diarrhœa.

Among the Makusis, the task of engaging carriers had been a somewhat difficult one at first, but as they became more accustomed to us, their unwillingness decreased. Numerous however were the excuses offered—"the parson's house needed finishing and they had to stay and finish it:" "Roraima was too far:" "Roraima was too cold:" "they were afraid of being killed by the Arrekunas." Then they wanted to know about the food on the journey; how long we were going to stay at Roraima; what they were going to get in payment; whether we would want them to go on the top of the mountain; and what route we were going to follow: and not till they were assured on all these various points, that everything would be all right, did their answer come:—*Wa!* they would go, it was good!

Next came the question of advances, for, as was explained, they did not feel bound to go until they had taken something from us. This, the direct result of the system pursued with them by the traders on the savannahs, was settled by the distribution of such articles as would be of use on the trip; and each man, we noticed, was careful to take with him his bundle containing his shirt, trousers, hat, belt, knife, file, razor, scissors, pins, needles, thread, handkerchief, and axe or cutlass, as the case might be. The former articles were generally put on during the journey before entering a village, evidently with the desire of impressing the inhabitants. For this purpose too, no doubt, as well as from the desire of ownership, they tried hard to obtain guns, beads and cloth before starting, but these it had been determined to distribute on the return, except in the case of four huntsmen, who, in lieu of axe or cutlass, were provided with guns and ammunition. One man only, a Makusi, refused to go because the gun was denied him.

In connection with barter, a curious idea seems to be prevalent among these people, to which expression is occasionally given, that the great spirit gave all these various articles to the white men from across the sea, to be distributed among the poor Indians, but that the wickedness of the white men compels the Indians to buy or work for them. Perhaps to this underlying belief, more than to the occasional experience of dishonest treatment by individual white men, may be traced their distrust, with the existence of which the traveller only becomes acquainted, when, by sympathetic treatment, he has won their absolute confidence, with its oft repeated

expression "Amoré wakibé, tierung paranakri alibé! (you are good, other white men are bad).

Special reference has here been made to the general conditions of life and work at Kwaimatta, since it seems to have become, and appears likely to remain, the chief inhabited centre on the lower Rupununi. Other large Makusi settlements which figure on our maps, such as Karinambo, Karinakru, and Pirara, have entirely disappeared, and many smaller villages are now practically deserted; but Kwaimatta has increased; and as the emporium of the N.E. savannah, affords facilities to-day for the dealer and the traveller that no other place offers.

Preparations for our journey being all completed, the illness of our Arrekunas alone interfered with our plans. Under the circumstances it was agreed that a Makusi advance party should proceed with McCONNELL and LENNOX as far as the Karona Falls on the Ireng river, three days' journey distant, where, fish and game being abundant, stores might be laid in for future use. On the 16th October this main body started, with the understanding that the remainder would follow under my charge on the 18th. Rice, flour, sugar and salt, had been put up in Georgetown in parafin tins, and furnished convenient loads of from 30–42 lbs., all being carried on the back in the usual Indian fashion, in the panniers known as *Surianas* on the coast, just as were the drying-press for plants, the camera, taxidermic and other apparatus, bottles of spirits, tins of meat, soups, milk, butter, cocoa and other such necessaries, besides the Indians' staff of life, cassava bread.

The weight carried by some of these people was certainly remarkable, amounting to more than 60 lbs., though

its full significance can only be understood from the further fact that these loads were carried from morning almost to night, through swamps and across creeks, up and down hill, and over a road that at the best was only an ill-defined track over extremely rough ground—often, in fact, over nothing but sharp pebbles, stones and boulders.

One splendidly built Indian from Warushi, MOSES by name, who seemed quite a giant in height and proportions among his companions, though indeed he was but about five feet nine inches tall, put together for himself a load of tins that could scarcely have been less than about 70 lbs., besides which he carried his own hammock and other belongings. He was evidently starting with the decided intention of earning a gun, for these much coveted articles had been promised as the reward of the best carriers of the party. He was one of the most pleasant of the Makusis, though exceedingly quiet and taciturn, and there was always a dignified smile on his face when he noticed me lifting his pack (which was always the heaviest) so as to compare his weight with the others. As soon as opportunity offered, I purposely lightened his load, for over the sharp rocky track across the steep mountains, it was more than a long day's burden—even for him. This casual testing of their loads, I found of considerable assistance in causing them to apportion the luggage fairly among themselves, whereas, if left to their own custom, it not infrequently happened that one bearer laboured under a really heavy burden, while another, from whose load supplies had been taken, trotted unconcernedly beside him with an almost empty pack. They soon recognised the justice of the innovation, and cheerfully divided any extra load.

LENNOX, who was not yet thoroughly strong, soon found that with the very arduous walking, the journey was out of the question for him, and it was therefore decided that he should await our return at Warushi, a large Makusi settlement splendidly situated among the hills to the East of the old village of Kwonga, whither the Rev. F. S. PRINGLE, who himself was by no means well, was at the same time travelling with a large retinue of its inhabitants.

I should like to take this opportunity of making our very heartiest acknowledgments to Mr. PRINGLE, for the great kindness shown and assistance given to our party, in the care which he thus took, for several weeks, of one of its members. But for his help indeed, we should have been in a quandary, the way out of which was certainly not evident.

On the morning of the 18th, the trouble with the Arrekunas came to a climax. Eight of them had answered the summons to make up packages preparatory to an early start, and had carried off their loads to the house in which they lodged; but when all other arrangements were completed, and the actual time for starting came, their headman announced that only five could go, the other three who were but lately recovered being again laid up with hot fever. As this was manifestly the case, nothing remained but to find three other carriers, and luckily as several Warushi people were making the journey thither with the Rev. F. W. B. DORSET in our company, this was accomplished through his help, though not without considerable difficulty. The promise too had to be given that fresh arrangements would be made at Warushi. It

was somewhat of a consolation to me then to reflect that I had been particularly kind and attentive to the Chief of this village, and that most likely the bread thus cast upon the waters at Kwaimatta would be found at Warushi, in the form of bearers: nor were my anticipations ill-founded.

The start had thus not been lacking in distressing features, which perhaps can only be fully understood by those who have had somewhat similar experiences. Under the impression that everything had been satisfactorily arranged, even to the committing to the charge of the Chief what stock we were leaving at Kwaimatta, the line of bearers had left the house in single file, crossed the open space in the village, and had defiled at a steady pace across the undulating savannahs, in the track of the men, women and children who were journeying to Warushi, some of whom were then some miles ahead—when suddenly I had been confronted with the finding of these three fresh bearers to replace the sick Arrekunas, whose recent indisposition had greatly reduced them from the robust condition in which they had entered the settlement some weeks previously. After much promising of good payment and much coaxing, two other bearers had come forward, but the third load—and that a heavy one—for a long time remained.

My only hope lay with a strongly built and splendidly proportioned young Makusi, the masher, dandy and finest dancer of the settlement, who hitherto had turned a deaf ear to all my invitations to join the Roraima party. He seemed just as obdurate to all persuasion to take the load as far as Warushi; but just as my patience with him was about exhausted, he suddenly

said he would go if I would pay him three shillings, and in advance. As the distance to be travelled was quite 40 miles, the sum was moderate to a degree, though to him it appeared to be more than I would give. But again I was in a quandary. I had no money about me; my bag was then some miles along the track; and though my canister in the house was available, he might walk away before I returned. Luckily Mr. BENTLEY, the gold and diamond expert, who was standing close by, watching our departure, lent me the requisite amount until I could go back to the house, and the young "brave" was secured, evidently to his own great surprise. He showed no demur however, but at once good-humouredly re-arranged the load in the pack, tied his hammock to it, and raising it on his back, stalked rapidly onwards along the track.

This young fellow, who, more than any other that I ever met, in his build, features and expression, resembled the higher types of the North American Indians, was after this one of our most efficient carriers, for he, as well as the other volunteers, just before we reached Warushi, gave me to understand, to my great gladness, that as they were already carrying my loads, they might just as well go on to Roraima. Their desire to possess the various articles that were waiting at the camp as payment on their return, the advances in barter or money that I gave them, the abundance of our provisions—more especially the sugar and salt of which they are inordinately fond, and the imposing array that our large party would present, were no doubt potent determining factors, though apart from kindly treatment, they would altogether have been unconsidered.

It had been a most pitiable sight to witness the distress of the sick Arrekunas bringing back the few articles of barter that had been given them as an advance, and laying them in a heap before me, telling of their inability to make the journey. For coveted items, they piteously begged; but articles of dress had necessarily to be given to, or kept for, the new carriers that would take their place, as a protection against cold in the higher lands; and it was only the smaller items that could be spared them as some compensation for the long time they had waited for us. At last everything was settled; and as I turned along the track, SCHOOLMASTER, the Arrekuna guide, raised his hands and blew for protection three times upon his sick people, and followed closely behind me. Instead, however, of the cool breezes of the early morning to cheer and invigorate, the fierce heat of the noontide sun beat down upon us; but now, at last, the most anxious part, as it seemed, of our five weeks' journey was over: we had really started.

Our Arrekunas had been very desirous of following a westerly track that they maintained was the best, crossing the Ireng and Kotinga rivers low down, and thence travelling through Brazilian territory; but SIMON, our Makusi captain, would have none of it. He selected a more northern course, crossing the Ireng at the great falls of Karona, and thence onwards between the two rivers in districts inhabited by Makusis. This course was evidently the shortest, but lay over a very mountainous country, while the Arrekunas explained that their track lay over nearly level savannahs and gave much less rough walking. Possibly their idea was based on the tracks pursued by

some of the earlier travellers, but the distance might have been much greater; and indeed, judging by the map which they showed us, there could not have been much difference between the two courses as regards the mountainous nature of the country. This map was in itself most unique and interesting, consisting of a short stick, cut round and incised in such a manner as to represent the savannahs by smooth areas of equal thickness, and the mountains by raised and thicker parts, the valleys between being represented by the various notches.

Our course from the village lay almost due north-west, across the Bononi Creek, towards an opening between the ranges of mountains that extend from Mora to the left bank of the Ireng. At the ford of the creek, the water rose to the shoulders, but shaded as it was by the over-arching of the trees that line its banks, it was delightfully cool, and compensated to some extent for the inconvenience of the crossing. Here were gathered the whole Warushi company and our bearers, awaiting us; and it was noticeable that since leaving the village they had divested themselves of all extraneous articles and clothing, in preparation for the hard work which lay before them on the long march, and wore simply their native costume of lap cloth or bead apron, according to their sex. As they passed onward, in single file, along the winding track across the parched savannah towards the mountains, even the children carrying some small item of baggage, and many of the men and boys their long bows and arrows or their gun, the picture was certainly a unique and imposing one—though it was difficult, in contrast to what had been the ordinary conditionment of life at Kwaimatta, to dis-

sociate from one's mind the idea of the unreality of the whole scene.

The nature of the track however soon claimed one's entire attention for walking. The heavy clay of the savannah, which is sparsely covered with coarse grass and sedges, here and there gathered into dense clumps, and dotted with the stunted Curatella bushes which form so characteristic a feature of the vegetation, was worn into an uneven rut-like trail, often broken by wide sun-cracks and roughened and deepened by the action of water; and as its course was never straight, but winded about in an amazingly serpentine manner, here and there, between the stumps and grassy clumps, one's eyes were constantly on the ground, and could only be lifted at considerable risk.

This may be described as being the general character of the tracks over the low-lying savannahs, many of which are covered by water in the wet season; and in many places indeed one has to wade through horribly dirty swamps where the water has not yet been quite dried up—the tenacious softened clay rendering the walking very tiresome. Over knolls and elevated parts, the track, as a rule, is covered by loose ironstone pebbles, which seem to have resulted largely from the gradual oxidation of the richly ferruginous clay of the huge conical nests of the Termites, which are so abundant over these districts. The disintegration of these nests, which are at times more than 7 or 8 feet high, and the exposure of the closely perforated inner chambers, more especially to the joint action of moisture and sun, and occasionally to that of fire resulting from the periodic conflagrations by which the Indians keep the savannahs clear, have certainly

resulted in the production of large quantities of such pebbles, and in many places the various stages of the process may be easily studied.

Early in the afternoon we began to ascend the first range of mountains, and discovered that what had seemed from a distance to be rounded grassy slopes, were in fact only piles of rocky masses, between which the various grasses had thickly grown, giving such a deceptively even appearance. Across these ranges the track led over either bare massive blocks, or broken pieces resulting from disintegration; and the walking became trying in the extreme, more especially where ascents and descents became frequent. Unaccustomed as we were to such travelling, our journeys for the first few days were necessarily short; and it was curious, as a matter of individual choice, that where my only comfort in walking was derived through wearing light canvas shoes with india-rubber soles, MCCONNELL preferred his heavier leather walking boots. The wear and tear to shoes was really startling; and it was a source of considerable disquietude, as it had been before to other travellers in these regions, whether one's supply would be found equal to the demand. Unless one has been in some similar condition, it is almost impossible to realise that some cherished plan of travel might have entirely to be abandoned, as has indeed been the case, through this simple question of boots. The explanation can only be found in the nature of the country over which one has to walk, and after a little experience one readily understands it.

Hardened as are the Indian's feet, even they are unable to bear such walking unshod, more especially

considering the heavy loads carried; and they use regularly a simple sandal cut from the broad leaf-stalk of the Eta palm *(Mauritia flexuosa)*, which is fastened to the feet by strings made from the fibres of the young leaves of the same plant. To those unaccustomed to these sandals, and especially to those who ordinarily wear shoes, they are a positive infliction, since one of the strings necessarily passes between the toes, where in a short time a wound is produced.

Steep as had been the ascent to the mountains, and rough as was the track, it had been with a realisation of intense gladness and of unutterable freedom, that one had emerged from the little forest that clothed the slopes, and had gazed down upon the open savannah that lay spread out some hundreds of feet below, and around upon the mountain peaks that broke the line of the horizon in all directions. Far across the savannah, the village of Kwaimatta could be distinguished—the only inhabited area in the vast extent, though signs of man's presence were to be seen where varying columns of smoke, or blackened patches, told of the beginning of the great fires of the dry season. On these burnt savannahs, the hard blackened stumps of *Eriocaulon* and *Pœpalanthus*, and the scorched clumps of *Curatella*, were the chief conspicuous features; but within a few days, the young grasses had sprouted, and many other species of plants, more especially of *Melastoma* and *Byrsonima*, began to show themselves. The flowers of the latter were indeed the most regular accompaniments of the savannah scenery, the golden spikes of *Byrsonima* being very noticeable.

The special roughness of the track among the moun-

tains was due to the nature of the rock material of which they are composed. For more than half the distance to Roraima, the prevailing country rock is quartz-felsite (sometimes referred to as elvanite), described by BARRINGTON BROWN as "quartz-porphyry and felstone," the weathering of which produces, as a rule, columnar and pinnacled groups and jagged and pointed surfaces, in marked contrast to the usually rounded forms of the granites. The quartz-felsite frequently passes into true felsite on the one hand, and into eurite on the other; while great veins and bosses of pure quartz are of very frequent occurrence.

On many of these bare rocks, great cactus heads grew, looking strikingly like enormous green sea-urchins, while among the clumps of bush which struggled for existence on the rocky area, were large patches of the thorny Bromeliads, the pinguin and the karata, the fruit of the former being generally eagerly sought for by the people. Along the water courses, the Eta palms gave frequent opportunities to our men to renew their sandals, and denoting the proximity of water they were often welcome sights to us. In such places, but more usually in the low valleys, the dead shells of the common species of the apple-snails, *Ampullaria glauca* and *A. amazonica,* were very abundant, the tests of the latter being as a rule reduced almost to the thinness of paper. Occasionally too the curiously curved ram's-horn *(A. cornu-arietes)* was to be seen, and the large lemon-snail *(Bulimus oblongus)* also, where the forest clumps broke the grassy stretches. Where fire had lately passed over these grassy valleys, large numbers of the dead tests of crabs also lay about, though the living forms were

never procurable. Now and then a small flock of quails *(Eupsychortyx cristatus)* would whir suddenly almost from our feet, dashing away so quickly into cover that it was most difficult to obtain them; while frequently the little kestrels hovered near us, and swooped upon their prey, careless of our presence. It was somewhat of a surprise to note that the indolent scissors-tailed shrikes *(Milvulus tyrannus)*, which were very common over the district, terrorised at will over these fierce little falcons, darting at and driving them away, even from their quarry.

About mid-day on Saturday we reached Warushi, after a most tiresome journey up and down steep hills, across low-lying valleys with deep swamps, and through the rushing waters of several creeks, though many of the water-courses were quite dried up. Frequent had been our stoppages, not only for rest, but to allow the stragglers, many of whom were often more than a mile behind, to come up to the main column of the party; and at such times we had been able to feast our eyes upon the grandeur of our surroundings.

From the crest of the highest peak, where, in a wooded valley 600 feet below, the Kaipong creek winds, we had been entranced by the magnificence of the panorama spread out before us. Mountain after mountain rose in all directions around, while far below lay the wide valley, shut in like a circular basin by successive peaks, as though they had been thus artificially arranged to guard its peacefulness and tranquility: and, over all, the bright sunshine poured, flooding the whole scene with beauty, throwing here the black rocks into sharp outline, and there the yellow grassy slopes

and green-hued forest clumps below; while on the distant peaks rested the cloudless azure of the skies. We were indeed among the mountains, and an indescribable charm thrilled our minds, the more so perhaps from the contrasts with the low coast lands which naturally arose. Numerous as such views were throughout our journey, there was yet always in them, from their infinite variety, a fascination and complete satisfaction of the senses.

In the middle of the open valley that lies beyond the Kaipong creek, there is a remarkable elongated mound of large blocks and small fragments of quartz, the outlines of which are sharply defined from the mud and clay of the level valley. From its height it would certainly be above the water during the floods of the rainy weather; and from its situation and structure, there was in my mind little doubt but that the hand of man had had a good deal to do with its history. Casual examination unfortunately threw no light upon it, nor was it possible to learn anything from the Indians.

At Warushi we were obliged to remain over the Sunday. A large quantity of cassava had been made after McCONNELL left, and other bearers were required; but although some three hundred people were then in the village to meet the parsons, it was out of the question to get any to start until the main services and the baptism of children had taken place. On the Sunday evening I was much amused by the eager manner with which one of the bearers brought his little boy to tell me his "piccaninny name JOHN QUELCH." Others of the party were, however, equally honoured.

The village is beautifully situated on a narrow, elevated

plateau, between high mountains, at the base of which the Urora creek rushes down its rocky bed. It consists of nearly a score of houses, many of large size, in a line along the plateau; and on mounting the hill, on our arrival, we had had to run the gauntlet of hand-shaking with a line of people nearly from one end to the other—men, women and children, all marshalled to receive us; though in the case of the little ones, the fits of crying and shrieking that greeted our near approach, rather took away from the dignity of the proceeding. On the slopes of the adjoining hills, the fields are situated; and as the soil is extremely rich and fertile, there is always an abundance of provisions; while, too, game is extremely plentiful in the high forest which here clothes the mountains.

Early on the Monday morning, bearers were told off for us by the chief; and saying a long goodbye to LENNOX DORSET and PRINGLE, we started for Karona, the path to which leads off the main track by which we had come, some six miles from Warushi. Here we had left our loads; and after a little rearrangement of the baggage, we were soon *en route* to join MCCONNELL.

Our track now lay almost due west, past the great hill on the top of which the old settlement of Kwonga had been situated, and across the rugged felsitic mountains, where the trail was even worse than that previously met with. About mid-day, after crossing the Shemapeur creek, we made a sudden ascent of about five hundred feet to an elevated plateau, on the eastern edge of which is the village of Sakume, consisting of three houses, and commanding extensive views in all directions, more especially to the south, where, in the far distance, a verdant-

green, level savannah lay, as in a frame, beyond a long avenue of dark and yellowish coloured mountains.

Late in the evening we came in view of the Ireng river (called by the Indians "Ileng"), and travelled for some distance along it; but it was not till next morning, after crossing the slippery rocky bed of the Tipuru creek, and over a most tiresome extent of loose sand and massive rocks by the riverside, above and below the creek, that we reached Karona falls. Luckily MCCONNELL and his party were all well, and there was a goodly stock of babracotted fish: our cassava however was a most welcome addition, for their supply had almost given out.

In April 1870, when exploring the Siparuni district, BARRINGTON BROWN had paid a short visit to these falls, and had described them when the river was extremely low: now, with the greater volume of water, they were correspondingly more grand and beautiful. The great dyke of massive rocks over which the water rushes with a total fall of about 90 feet, forms an extended bed of about 200 yards in width, with long sloping irregular cataracts on each side; but in the middle it has been cut back by the main body of the river into huge blocks, over and between which, the water thunders in a vertical fall of about 40 feet. Massive rocky areas, here and there tree-clad or covered with species of *Lacis*, stand out as small islets between the channels; and on both banks high forested hills add an additional charm to the picture. In the wet season, when the great bulk of water spreads over the wide bed, the falls must be magnificent in the extreme.

The formation over the whole district consists of the quartz-felsite previously mentioned, the felspar being in

many parts replaced by hornblende; while the quartz crystals also die out, and give rise to a very dense felsite, often of a beautiful green colour.

About the Karona falls, fish are extremely plentiful; and the Indians of the district, even from Warushi, go there frequently for fishing. On our return from Roraima we again camped at this lovely spot; and by means of dynamite cartridges procured an astonishing quantity of many different species—much to the surprise and delight of our people, who not only feasted to their heart's content, but spent a busy night superintending the numerous wooden platforms, or babracots, on which the fish were being dried. Owing to the large quantity of fat which soaked the sticks, they very frequently burst into flame, and threatened the destruction of the fish.

The picture which our camp presented on that evening, was peculiarly striking. The leaping fires among the trees, against the dark background of forest; the bare black rocks shining in the fire-light; the naked figures of the people passing in and out among the gleaming lights; the gigantic leaves of the great Bromeliads which stood out like huge barriers here and there; and the swinging hammocks—and with all, the thunder of the falls booming on the ears—produced an effect, the weirdness of which is indescribable.

On Wednesday morning, we crossed the river above the falls by means of two very roughly hollowed, cranky corials, which held each only two men with their loads; and the crossing thus took more than an hour. About mid-day, after journeying along the wooded banks of the Ireng river and the Kurewaka creek, and over several small streams, we reached the settlement of Kosanota, com-

prising four houses, where large quantities of paiworri had been prepared for us. Here quite a market was opened in the afternoon, small quantities of cassava, pumpkin and sweet potato, being arranged in little heaps in the open space in front of the Chief's house, by the different people who had collected at the village. The demands of barter for each heap were however absurdly exorbitant, and as the people of the village, as well as the greater number of our bearers, were all fuddled by their paiworri bout, and equally unreasonable, the whole transaction became, before it was over, a most serious trial of both patience and temper.

Not far from this village was a small settlement of two houses, Warapata, which we passed early next morning, where it had been amusing to note the various materials used as necklaces for the children, such as the toes and ear bones of the accouri, and pieces of crockery and ramrods. Many of the men wore small triangular ear-rings beaten out from silver coins, but the rest of their ornamentation consisted chiefly of dye-marks on their faces. Large quantities of corn were stored high up under the roof of the houses; and a drink made from this cereal, known as soporé, which they had prepared in large quantities for our peeple, formed a by no means unpleasant beverage.

Our track, which seemed to get worse the further we travelled, lay now nearly due N.W., over successive ranges of felsitic mountains and intervening lowlands. The bare quartz-felsite became weathered out into huge elongated blocks and pointed columns and pinnacles, forming characteristic features of the scenery on the savannahs, and on the slopes and summits of the hills,

where they rose often quite 30 feet, clear above all vegetation. Numerous veins of quartz of variable thickness were observable, chiefly in the beds of many of the watercourses, where they were especially conspicuous; and loose and sharp fragments of the rock formed extensive hills, over which the walking was painful in the extreme. Casual examination, such as we could make, gave no indication of gold in any of these rocks, but it is probable that the metal exists in the locality.

Of living forms, the district seemed to be very barren. Large harrier hawks *(Circus maculosus)* occasionally were seen floating over head; while the common Tyrannus *(T. melancholicus)*, the savannah thrush *(Mimus gilvus)*, the small ruddy dove *(Zenaida vinaceo-rufa)* and the grey ground-dove *(Chamæpelia griseola)*, were now and then met with. Of insects, hardly one was to be seen; though at times, *Urania leilus* flew hurriedly by, or a small grasshopper jumped aside.

A tiny convolvulus with bright blue flowers was almost a constant accompaniment of the track, and mauve and white flowered forms seemed to prefer the raised conical ant-hills of the Termites, which were often so numerous as to resemble, from a distance, a village of small houses. After leaving the Ireng, a fragrant purple-flowered *Rhynchanthera* had been plentiful by one of the creeks, along whose courses the greater number of flowering plants were to be found; but it was not again met with. The yellow-flowered *Jussiæa* grew by almost every stream, with numerous species of Melastomas; and here and there, in the same situation, the deep blue-flowered *Stachytarpheta mutabilis*. On the parched and arid savannah, the prevailing forms were still the

common *Curatella* and *Byrsonima*, which were in full bloom.

Frequently in these savannah journeys, the traveller suffers greatly from want of water, having often to depend on widely distant stagnant pools, where, in the dry weather, the contents are more numerous than desirable. Luckily we were fortunate in this respect, very few of the various streams being altogether dried up; and where they widened out into large open ponds, a plunge and a swim were refreshing beyond expression.

The Akouli creek, which is a southern branch of the Kurewaka, and flows into it not far from its junction with the Ireng, wound frequently across our course, taking its rise in an extensive range of mountains, south-west of the great bend of the Ireng, from different parts of which the Kurewaka, the Marakang and the Sassaouta also spring. On the map of the colony, the course of the Kurewaka is shown running nearly due east and west, to just above Karona, whereas both that creek and the Akouli have in fact a south-east and north-west direction. The Sassaouta too lies North of the Marakang, and both creeks run, not into the Kotinga as shewn in the map, but into the Ireng, south-east of the Mataruka mountains.

It was from the top of one of the high mountains, just before reaching the Marakang creek, that we got, on Friday 26th, our first view of Roraima, while still about six days' journey distant. At first Waitipu alone was distinguishable; but even as we gazed, absorbed by the vast panorama of great mountain ranges that rose almost in series before us, the clouds shifted; and the faint outlines of the distant pile, became clearly visible against the sky.

Just then a hue and cry was raised, and the men dashed off as fast as they could over the rocky mountain-side, in pursuit of a deer *(Cariacus savannarum)*, which had been observed crossing the opposite hill. The animal had had too long a start however, and ere the hunters could get within range, it had disappeared over the crest of the hill. So protective is the colouring of these animals on the open country, that until it had been outlined against the sky as it disappeared, I had been quite unable to distinguish it.

Frequent views were now obtained of the great peaks of the sandstone formation—the Pacaraima mountains—to the N.W.; and even Tawailing mountain, to the East of the Ireng, had become dimly visible as we approached the dividing line of the sandstone and quartz-felsite formations. Our track, however, became even less defined than it had been.

Soon after crossing the Sassaouta, on Saturday, we came upon the Makusi village of Pelepowta, consisting of three groups of three houses and sheds, separated from each other by about a mile—where we purchased, through the old chief, ADAM, a large supply of cassava, yams, plantains, pumpkins, corn, corn-meal and honey, and where the men indulged freely in the various drinks obtainable. On passing through this village on the return journey, we were equally fortunate, Captain LONK, of Konkamo—a large settlement on the eastern side of the Ireng—having brought us large supplies. The districts about these two villages were evidently extremely fertile, and the vegetables bought were splendid samples of their kind.

As at Kwaimatta, water was obtained from a series of

holes dug at the base of the hill on which the settlement is placed—though a creek of splendidly clear water was not very far distant.

It was at this settlement that we noticed, for the first time, that extreme amount of ornamentation of the body by dyes of various colours, that we found so marked a characteristic of the people in the villages on these little-travelled parts of the country. The women and girls, particularly, were remarkable for the amount of the linear and dotted ornamentation, especially on the limbs; and at a little distance, they not infrequently had the appearance of being dressed in parti-coloured "tights." The queyus too were remarkable owing to their small bead surface, the greater extent being taken up by wide cotton fringes; while their necklaces were almost entirely of seeds. These conditions are of course explainable by their distance from the travelled trade centres, where, owing to the possession of sufficient cloth, and especially of beads, the people have abandoned the ornamentation by dyes and seeds. It was noteworthy however, even at such a centre as Kwaimatta, that occasionally—especially at the time of their tribal dances—many of the girls and women in particular, gave up their dresses and beads, wholly or in part, and appeared decked out in all the brilliance of their ornamentation by dyes.

Here too we met the first members of the tribe of the *Monikos*, who with the *Sokorikos* inhabit the districts on both banks of the Kotinga, though chiefly on the Brazilian side. These tribes, which are almost unknown, are branches of the Carib race, speaking languages different from each other, and from the Arrekunas and Makusis, though all intelligible to one another. A very marked

feature in all their houses are the rude imitations of birds, chiefly of the herons, the negrocop, the muscovy duck and the swallow-tailed hawk, which are made from cotton thread, and corn cobs and sticks, and are suspended high up under the roofs of the houses, in the positions occupied during flight.

On leaving the village on Sunday morning we followed a track leading nearly due west, with much easier walking than before, there being few stones or sharp pebbles. The ridges were also less elevated, though giving very magnificent views of the conical peak of Zapang, to the north-west, in Brazil; and of the Pacara-yena and Kumararing peaks in the sandstone range, to the North and East. Frequently we crossed the winding course of the Soko creek running to the Kotinga, where masses of diorite were common in the bed, and luxuriant growths of yellow-flowered Crotalarias lined the banks.

Early in the morning we reached two settlements of the Sokorikos—the larger known as Elela—where our appearance considerably frightened the people, who after spying us out from a distance, had returned into their houses, covering themselves in their hammocks, or hiding in the darker parts behind the larger baskets and pots, to escape observation. Not a sound was to be heard—not even from their dogs—as we approached; and evidently they hoped to escape notice. Our Makusis, however, soon convinced them to the contrary, for they entered the house and searched it through for drink and fruit—while the women and children huddled together in the farthest corner of the house, trembling with fear. Our Arrekunas meantime stood outside looking on with contempt at the Makusi raid; and SCHOOLMASTER came

quietly up to me, and whispered "*Makusi wakibé pra*" (Makusis are bad), opening his mouth wide and closing it, repeatedly, to indicate their greed.

After a little while, seeing they were not molested, the women became quite garrulous, telling how they had mistaken us for Brazilians come to take them away for forced labour as slaves. So badly off were these people in this out of the way district, that one woman, who seemed the most important from her talkativeness, had only a small dirty piece of calico suspended from her loins, in place of the ordinary bead queyu.

As we were just about to enter Brazilian territory, where a similar Makusi raid on the houses might be interpreted by the Brazilians as an attack on the people by an English force—for indeed our party was an imposing one, numbering 46 people, many of them carrying guns—I took the opportunity of cautioning our bearers against any repetition of such conduct, threatening to withhold all payment from any one who was guilty of any infringement of the order. In the case of the Arrekunas, who were acquainted with the people, there was no such danger.

The villagers were well indemnified for their loss, and they were intensely delighted with the barter which was given them. By this time, the bead-less lady has no doubt discarded her dirty slip of calico, and is gorgeous in her new queyu. The old adage "Tis is an ill wind, etc." was certainly well exemplified in her case.

From Elela to the Kotinga river, the track was simply terrible—the trail leading over a constant succession of sharp and rough stones. Early in the afternoon, we reached the crest of the wide valley in which, some 700

feet below, the Kotinga runs—its foaming waters, due to its greatly obstructed course, throwing it into sharp contrast with the rocks and vegetation; and after a most difficult piece of walking down the steep slope, over rocks of all sizes, often loosely balanced and hidden by long grass, in which, apparently, there was no definable track, we crossed the Soko again near its mouth, and came out on the main river just where it is divided by a large island, and widens out into a long, sloping, shallow rapid.

Here was the ford known as Sokoking; but it was barely passable at the time, and would be utterly impracticable and dangerous at higher water. The river ran swiftly over a bed of loose and slippery rocks; and though the water only rose, at the highest, to near the waist, it was a most difficult matter to keep one's footing, slowly as one might move. By the aid of stout poles, the Indians managed to support themselves with their loads, though not a few had to be helped by the stronger men, and one or two even came to grief. No serious damage, however, was done to any of the packages.

As at Sokoking, fords are usually situated where shallow rapids occur along the rivers, and where wooded islands in the rapids give conveniences for camping. In our island camp we not only secured shelter among the trees, but protection from the great fires set by our Arrekunas to clear the slopes on the Brazilian side. The long dry grass and bush burned fiercely during the evening along the valley, and, driven by the wind, the flames spread with intense rapidity up the steep slope, lighting up the scene, and with the dense columns of smoke presenting a magnificent and unique spectacle. Next morning the wisdom

of our guide was shown, for the narrow track lay bare and easily discernible, winding among the rocks on the hill side, to the plateau above.

Not far above the ford was a small house on the slope on the English frontier, and close by were the beautiful falls of Piawa, where the river flows over a massive outcrop of green felsite, which gives its tint to the thinner sheets of water, and gleams with a brightness of colour distinguishable at a considerable distance. Flowing from the great elevations of the sandstone range, the Kotinga and the Ireng rivers have cut out for themselves enormous valleys; and before reaching the level of the low-lying savannahs, their course is broken by numerous rapids, cataracts and falls, which render navigation almost out of the question.

From the reports of previous travellers, who seem to have suffered severely, we had been expecting to meet quite plagues of sandflies by these streams; but we were altogether untroubled throughout the Roraima journey. *Bête rouge* too, that pest of the grass lands on the coast, was quite absent from the savannah, no doubt due to the frequent clearing by fire, or submersion by floods, according to the place and season.

From the Kotinga, our track lay entirely in Brazilian territory, at first in a westerly direction; but we soon struck a more defined, though equally rough, trail towards the N., and quite early in the morning came upon a small settlement of the Monikos, with the redoubtable name of Yamaku-melu-bongong—that is, "the village by the Yamaku creek." In these outlying districts, a very marked feature of the houses, which had the usual conical-shaped roof and wattled clay sides, was the

strength and solidity of the doors and fastenings—the opening being narrow and low—as though intended for protection against foes.

As had been the case with the Sokorikos at Elela, the Monikos seemed quite terrified at the sight of strangers; and though they had come out of their houses when we first came in sight, the greater number had betaken themselves inside again long before we reached the settlement. A few men seemed at first as if they would await us by their door, but as we came closer, their courage failed them, and they too slunk away inside. SCHOOLMASTER, standing by the door, held a short palaver with them, but no one ventured outside; and on entering we found them either covered over in their hammocks, or crouching in the back, huddled up in the darker places, and shivering with fear.

In these wattled houses with such small doors, the first impression on entering is that of intense darkness, and it is some little time before one's eyes get at all accustomed to the gloom, and can distinguish objects. Usually the doors are fairly large among the Makusi houses, and the gloom is therefore less.

The people, after a little while, got reassured as to their safety, and produced the customary cassava and pepper-pot—the latter, however, being destitute of meat, and consisting but of a quantity of pepper and leaves boiled down to a thick juicy mass. Indeed this is the general character of the Indians' pepper-pot, though it is frequently thickened with cassava starch. A few gourds of paiworri were also brought out; and in return we gave them a few small articles of barter. The curiosity of some of the people as to the various things that we had, and their

wonder and delight on seeing them, were quite amusing to witness—one man in particular seeming anxious to examine everything, rushing about from one load to another, gesticulating, and calling to his companions, in a perfectly child-like—if not indeed idiotic—manner.

On leaving the settlement, our track led over a steep hill, from the top of which Waitipu and Roraima appeared faintly visible in the far distance; but they were soon lost to view as we descended into a wide savannah valley, skirting the Kotinga, which lay some distance to the east To the N.E., the opening of the Karakanang creek appeared, on the opposite side, where the great barren cliffs of the Pacaraima mountains abut on the river, like a continuous series of gigantic and terraced fortifications. About mid-day we passed a deserted field, where there was a large patch of tall sugar canes, which, loaded as our men already were, proved yet too great a temptation to be resisted; and several of the Makusis afterwards came up with a very considerable addition to their already heavy loads. During the breakfast hour, however, it had all disappeared.

Early in the afternoon we reached another Moniko settlement by the Elishi creek, Yaremouta, where a large party of Indians—Kwatingos they called themselves—from the head of the Kotinga river, was then residing. The word *Kotinga* is evidently derived from a mispronunciation of *Kwating*, the Indian name of the river. The greater number of these people were women and children, and without exception, they were all squat, dirty, and repulsive-looking—their hair being extremely coarse, matted, and bristly, and their bodies very considerably stained with red, black, and blue dyes—to such an extent indeed,

that there was but little of their skin that was not more or less dirtily besmeared.

From a distance we had seen them watching us, but they had all disappeared in the houses as we approached. So great was their terror, that, no doubt, if there had been any forest to hide in, they would have run away. As it was, they huddled together in the darkest parts of the houses, the children shrieking as we came at all near them, and the men and women shrinking and trembling, so as to be almost unable to stand. Possibly, from our bearded faces and greater height, MCCONNELL and I looked as dreadful and repulsive to them as they to us. Gradually, however, they regained their assurance, and eventually brought for sale supplies of cassava, yams, pumpkins, bananas, corn, and large quantities of sugar cane, which evidently grew in profusion in the neighbourhood.

Corn seems to form in these districts a very large proportion of the food; and, in most houses, large quantities were stocked high up under the roof—though indeed this was more especially the case in the settlements met with on the return journey across the Pacaraima mountains, between the Ireng and Kotinga rivers. In the fresh young state, it is eaten on the cob after being roasted: but usually it is left in the fields till quite mature, when the grains are parched on the baking slabs, and then eaten, or ground in a wooden mortar into a fine meal. As previously stated, a by no means unpleasant beverage is also prepared from it.

Of meat or fish there was none to be got at any of the settlements. It had been, in fact, quite a surprise to me to note how very large a proportion of the food of the people was purely of a vegetable nature. Game is extremely

scarce over these open savannah hills; and the deer and tapir, which are the most common, are usually only obtained by organised hunts, frequently extending over several days. Fish, too, is by no means abundant in the exposed streams, the greater part of the supply consisting of the small and mailed Siluroids which dwell inside the holes along the banks, and beneath the stones. These are usually spitted and roasted, being found at times about the houses in a perfectly dried condition.

A small red and black grasshopper, which is sometimes met with in clusters on the low bushes, appears to be a very great delicacy when cooked. SCHOOLMASTER, who was generally not far from me, invariably gathered them, and smilingly remarked "good breakfashee" to all my expostulations.

At Yaremouta we divided our party. MCCONNELL'S feet had become quite sore from chigoes in the soles; and a day's rest was advisable. He therefore remained behind with some of the slowest of the bearers, to follow more leisurely the next day; and I started with the main body, intending to begin cutting the track up Roraima until he should rejoin me.

During the morning, we travelled through comparatively level country for some distance along the banks of the Kotinga, where, on the Brazilian side, there are frequent outcrops of gneiss, and dykes of diorite. On the eastern bank, there rose abruptly the precipitous terraced cliffs of the great sandstone formation, the western extension of which we entered about mid-day between high hills of white and reddish shales, abounding in huge ruts and sun-cracks. Over whole tracts of the shale there is not a particle of vegetation; and, as extensive beds occur in

many parts of the sandstone, they give a very peculiar aspect to the scenery. The heat and glare on these bare tracts, more especially in the enclosed valleys, are trying almost beyond endurance, inducing after a time a feeling as though one were passing through some sort of nightmare.

Early in the afternoon we had reached the base of a very high and heavily forested mountain, which our men pronounced a good hunting ground, especially for deer. The huntsmen were accordingly sent out; but they only brought back three accouries, a maroodi, a toucan and a parrot. Before starting, one of the men had caught a small black frog, barred and spotted with gold, and tied it up as a beena for deer: but the deer evidently had not felt the spell, though its tracks had been noticed.

Towards evening, peals of thunder among the mountains warned us of rain, and soon, for the first time since we had left Kwaimatta, it descended in torrents, and lasted about two hours. During the next three days, we had showers at intervals towards night-fall, but never sufficiently heavy to cause actual inconvenience.

Many of the valleys and mountain slopes in the sandstone formation are extremely fertile, being covered with high forest, in which palms, and particularly the tooroo *(Œnocarpus batawa)*, are conspicuous features. The vegetables produced in some of these districts where there are settlements, are equal to anything that could be produced elsewhere.

Here, too, the beauty and grandeur of the scenery, viewed from the top of the mountains, are always sufficient compensation for the hard toil of the ascent—the varied tints in the forest, and especially

that of the large spreading leaves of the tooroo, contrasting delightfully with the parched grassy slopes, and the bare rocky patches and projecting crags.

Frequent were such views on the Wednesday; and especially magnificent was that from the top of the great peak of Tapuyaima, where, on the one side, Roraima and Waitipu could be seen, partly veiled by cloud, far away in the north-west; and on the other, the open valley of the Kotinga, spread out below, and broken, and flanked, by great ridges and isolated peaks. The illimitableness of the scene seemed to arouse a strange feeling of emotion —a passionate exultation, as it were, in the beauty, the radiance, and the immensity of nature.

During the remainder of the journey, Roraima and Waitipu were constantly in sight where the track led along the ridges, or over the mountain passes. Gradually, since entering the sandstone range, we had attained a considerable elevation above the sea-level, the ascents up the terraced slopes being always considerably greater than the descents; and in many places where the hills rose in almost precipitous crags, the climbing in a zigzag manner over the weathered and roughened rock, considerably tried one's strength.

One such winding ascent, in particular, over a loose gravelly surface, was made about mid-day on Wednesday, just before reaching the Kunor creek, where, from the steepness of the mountain, and the great depth of the valley, a chance slip would have resulted in almost certain death. The Indians, though they frequently paused to rest, seemed to suffer no special inconvenience from their loads; but our black attendant confessed afterwards that he had made the ascent in fear and trembling.

The Kunor creek, which is quite a large stream, was forded where a small island divided the channel, and where an extensive growth of the wild canes *(Gynerium saccharoides)*, in full flower, gave quite a touch of colour to the landscape. A few orchids and papilionaceous plants, with brilliant magenta and mauve flowers, were met with along the small creeks, and in the swampy valleys; but the most brilliant display occurred where great clumps of *Epidendrum elongatum* threw out masses of spikes of its beautifully tinted red or purple flowers. Among the *Curatella* trees, were scattered bushes with pure white and pale cream-coloured tiny flowers, whose delicate fragrance often relieved the sultriness of the air. Among these bushes, flitted occasionally the lovely scarlet tanagers *(Pyranga æstiva)*, but they were too shy to give a chance of a shot.

One of the most distinctly curious organisms met with on the almost barren sandstone, was a small terrestrial caterpillar, the body of which was covered with black, red and yellow hairs. Its power of motion was quite different from that of ordinary caterpillars, for when the creature was disturbed it actually *ran*. It was curious too, to notice, on the arid savannahs that had lately been cleared by fire, many leguminous plants growing to, and flowering at, a height of five and six inches, which ordinarily flourish by the watercourses as quite tall bushes.

In the deep valleys there were always creeks with rocky channels; but where there were gentle slopes, frequent swamps were encountered, in which we sank up to the hips in a deep red loam and ooze, derived chiefly from the red shale washed down from the hills.

So tenacious was this ooze that it was with difficulty our feet were withdrawn, while our clothes bore evidence of its red colouring even after they had been repeatedly washed.

Early on Thursday, November 1st, we came upon a small Arrekuna settlement by the Nabaru creek, where there were a few huntsmen. The single house was unique in that it was thatched with Eta palm leaves right down to the ground, being thus destitute of the usual wattled clay sides. It was scantily furnished with a few small gourds, a baking slab, some fish nets, a short blow-pipe, and some long bows and arrows; and a small cassava field had been made not more than a few yards away. High up among the hills, there was another such house, but it was not visited, being far eastward of our track, which led in a north-west direction up a series of steep terraced slopes to a height of 3,000 feet above the sea-level.

The steep and sudden ascents and descents, and the arduous walking during the long journey, had begun to tell unmistakably upon our carriers, and several of them began to complain of fever or sore feet. When, therefore, we came at mid-day to a deserted settlement of three houses by the Tolimbaru Creek, we camped for half-a-day's rest—the more especially that the darkened clouds and distant thunder warned us of approaching rain.

Here we obtained a couple bunches of green bananas, a few yams, and some sugar cane from the abandoned field; but game was nowhere to be met with. Indeed, the huntsmen seemed too worn out to make any serious and prolonged attempt, in spite of the fact that so little meat had been hitherto procured.

Close by the houses grew clumps of a bushy Solanum

with large spiny leaves and thick stem, bearing a magnificently golden-coloured fruit, almost about the size of a small orange, and said to be very poisonous by the people. So regularly did this plant occur at the various settlements that there could be little doubt that it bore some relation to the life of the people; but all enquiries failed to elicit information as to its value and uses. Commonly, also, there grew with it another strikingly similar, but non-prickly species, in which the leaves were larger, and the fruit more oval, but edible, with a taste very like a tomato.

On the opposite side of the creek by which we had camped, the bank rose suddenly upwards by a series of grassy terraces for 500 feet to the crest of the mountain, Tolimbarutipeur, and from below the bare track was clearly visible, winding upwards over the face of the mountain.

Early on Friday morning, in the cool, crisp, bracing air, we climbed this ascent, enjoying to the fullest the cold breeze that blew down the valley, laden with the perfume of the white-flowered bushes on the uplands. Up and up we climbed, over terrace after terrace, where we frequently paused to feast on the magnificent views of the Kotinga valley below, with its prevailing extent of lowlands on the Brazilian bank and of bastioned uplands on the English frontier. Until at last, just at sunrise, we reached the open plateau above, and forgetting that there was even such a place as the Kotinga valley, stood absorbed and rivetted by the altogether gorgeous and unique spectacle before us.

From East to West, the undulating savannah stretched to where, some score of miles away, the mountain peaks

of the old sandstone range stood like gigantic remnants of a titanic amphitheatre, ranged along the horizon, magnificent in form, colour, and proportions. In the far west rose the forested sloping base of Roraima, on the top of which, like the massive walls of an enormous quadrangular fortification, shone its immensely high, flat-topped, vertical pediment, with its bare and somewhat blackened sides gleaming like weathered cliffs of chalk. Partially hidden on its left lay the similarly-formed mass of Kukenaam, and, on its right, other irregular smaller peaks. In perfect contrast to Roraima, the enormous mass of Waitipu, irregularly terraced and dome-shaped, and flanked by the conical peaks of Womik and Makulitpeur, fronted us in the East, splendid in its prevailing verdure.

Not a cloud obscured the brightness of the skies; and the gilded ridges and pinnacles, the terraced slopes, and the precipitous walls and columnar escarpments, seemingly instinct with life where small torrents of water leapt forth from the summit down their immensity of height, stood out sharply and clearly defined as the sunlight spread over the scene, banishing the fantastic shadows that stole along the heights; while the bare, rocky faces, the grassy slopes, and the tree-clad patches, and, here and there, the foaming torrents, presented an infinitude of tints and shades, that seemed rather the vagaries of the imagination than actual manifestations of the beautiful in nature.

There had always been a keen enjoyment of the early marches from camp in the freshness and coolness of the morning, but to-day our appreciation was infinitely keener. On the open plain, 3,500ft. above the sea-level,

the breeze was crisp and cold; and the bracing air sensibly gladdened us and quickened our movements.

As the sun rose higher, tiny filmy cloudlets floated upwards from the valleys between the mountains, and drifted across the heights, and gradually increasing and thickening, they eventually lay on various parts of the range. No doubt they were largely due to the rains which had fallen during the night, which also had given volume to the small streams flowing from the top of the vertical plateaux, so that now they leapt down as continuous waterfalls from the summit to the forest-covered slopes, quite 1,500ft. below.

At mid-day we reached the small settlement of Mowaimata where we camped to rest the men, and to await supplies of cassava which were promised for the next morning. Here also from the slight elevation on which the settlement is placed, we had a magnificent panoramic view of the great mountains; but Waitipu from this position had lost its dome-shaped form, and lay extended like a lion at rest. All the morning the group had been in view, except for the few minutes when we had descended into the shallow valleys, and had crossed many of the tributary creeks of the Arabapu.

At the crossing of the Ekoibaru (or snake river) there was a beautiful fall, where the stream widened out over a slippery bed of jasper and sandstone, cutting it back into the form of a semi-circle, over which the water fell—mostly in a series of steps—for about 20 feet into a shallow pool. In many of the streams in the sandstone formation, this jasper is very commonly met with, being either bright red or green, and generally regularly jointed into large and small blocks as though laid and fitted by man's

hand. In the conglomerates too, the rounded pebbles of the red jasper are very frequently seen.

At Mowaimata we passed what might be called our only uncomfortable night since leaving Kwaimatta. On the less elevated savannahs, we had at times slept in the open without even the shelter of trees, and had done so without inconvenience; but on these elevated tracts, it was out of the question, as we found on this evening. The greater number of our bearers had crowded into the house, slinging their hammocks wherever a chance offered, but a good many had camped with me outside; and as the night wore on, and the heavy dew fell, and the cold damp winds from the mountains blew across the bare, unprotected camp, not even the many fires that the Indians made could keep the hammocks dry, nor give warmth to the body. When towards morning the thermometer fell to 54°, all idea of sleep was given up, and the men huddled closely round the fire where the flames even licked their bodies.

On Saturday after crossing the Arabapu, and several small tributaries of the Kukenaam river from the south-west slopes of Roraima, we reached the Arrekuna village Kamaivawong, recently built at the base of the twin mountains, 3,400 feet above the sea-level, and situated not far from the south-east corner of Kukenaam, close to the eastern bank of the river from that plateau.

Early in the morning we had faced the south-east wall of Roraima, but later on had rounded the southern angle to reach the western side, where, from the village of Kamaivawong, the track leads upward to the ledge on the south-west wall by which the ascent is made to the summit of the mountain.

Across the Kukenaam river, some distance up the slope to the west, is situated the settlement of Tewono (Terouta of the Makusis), where previous visitors to Roraima had made their first camp. Both these villages had been visible from the crests of the higher undulations of the savannah, some distance away; and many guns had been discharged by us as a salute, in accordance with Indian custom. Our greeting had been duly acknowledged; and on reaching the last deep valley, our bearers had only waited to don their clothes before marching into Kamaivawong.

Our reception by the people, who stood in a long line to shake hands, was courteous and dignified; but it was rendered somewhat comical by the appearance of the chief and his brother. The former stood at the end of the line in the centre of the village; and in his dress of tightly-buttoned, black frockcoat, check trousers, black round hat, and shoes, he would have been very presentable; but he had added to it a pair of braces, thrown over his coat on his shoulders, and a large quantity of pink ribbons which floated about him from his hat and neck. His brother wore an indescribably dirty coat and trousers and a large red blanket, from which his head protruded through a hole near the middle. The rest of the people were almost destitute of clothes other than their ordinary lap cloth or bead apron, though much ornamented by dyes on their face and limbs.

Their hospitality was apparently unbounded. Large cakes of cassava, and several pepper-pots were placed before us; and then a considerable quantity of paiworri and kasiri, of which our thirsty men drank till their appetite was appeased. As we found out later, their very

generous treatment was based on expectation of payment.

One of the large houses, of which there were five besides the "church", was assigned to us; and we had hardly had time to look about the village, sling hammocks, and arrange the loads, before the cry "Paranakri" was raised outside; and there, on the crest of a very high hill, appeared McCONNELL and his party in the distance, outlined against the sky. Soon after they reached the village, and were all, I was glad to find, in good condition.

After their day's rest at Yaremouta, they had travelled at a rapid rate; and had thus reached Roraima immediately after us—this was of course due to the fact that we had been obliged to camp for three half-days after leaving them.

The journey from Kwaimatta had thus taken us nearly 17 days, but of these 6½ days had been passed in camp. Owing to the rough walking and the heavy loads, these stoppages for rest had been unavoidable. On the return journey, we reached Kwaimatta on the eleventh day, two days out of the eleven being passed in camp. The loads then, however, were very much less.

Around the village of Kamaivawong the savannah extends with frequent undulations and small valleys cut down by the numerous creeks which drain the slopes. Scattered about are massive blocks of diorite and sandstone, especially abundant up the slopes, where the track to the summit of Roraima leads first through a small forest belt, and then for some miles over intervening rounded grassy knolls, one above another, before reaching the dense forest that surrounds the base of the flat-topped, vertical walls.

The face of the mountain was perfectly clear and unclouded during the afternoon, and the bare sandstone walls shone with a markedly reddish tint in the sunlight, though great areas are blackened by weathering. The edge, which had from a distance seemed quite straight and even, is really jagged and irregular, more especially where it has been cut into gullies by the water discharged from the top after rain; and the whole face instead of being an even wall, is equally rough and irregular.

Certainly the most conspicuous feature of this south-west face is the tree-clad ledge that runs obliquely westwards from the forest below up to the summit; and with this line before one's eyes, clearly visible by its green tint even from beyond the village, it seems incomprehensible that any one should have desired to climb the mountain who did not at once make the attempt by this apparent path. True the ledge appears to be entirely broken towards its upper part by a wide and precipitous gully, and therefore apparently impassable, but, as was found to be the case by IM THURN and PERKINS when they made their ascent, it was quite as likely to be passable. WHITELEY in his account of his Roraima experiences, certainly mentions this ledge as one to which he had sent Indians to cut a track, but they had cleared in a wrong direction, and when he reached his highest point, a sudden mist compelled him to descend.

From the village one gets a very good view of some of the waterfalls from the top of the mountains. From Kukenaam a large stream falls, which joins with another, the Kamaiva—hence Kamaivawong—from the western corner of Roraima, to make the large Kukenaam river.

In the deep gully on the ledge, already mentioned, a small stream falls as rain, except after heavy showers when it becomes swollen. This is the Roraiwa-paru. Many other smaller streams are also noticeable on this face of the cliff; while on the eastern face—as no doubt, too, on the other sides—there are many others which, falling sheer down for 1,500 feet, after heavy rains, are much more imposing. These various streams run to the Orinoco, the Amazon and the Essequibo.

Even from the village, one hardly realises the great height of the mountains. Kukenaam indeed is much more bold-looking, owing to its sudden rise from the savannah: while the height of Roraima is comparatively detracted from by the ranges of hills and ridges which run towards it. One always has the idea, too, that it is close, when really it is a considerable distance away—its apparent proximity being due to the clearness and definiteness of its bare walls.

On Sunday morning MCCONNELL and I started up the mountain to select the highest site available for a camp.

Taking SCHOOLMASTER and another Arrekuna with us, we followed a well marked trail, the lower part of which is in constant use to reach the fertile provision fields on the wooded slopes of Kukenaam. Below the first forest belt, the track was obliterated by a tall dense growth of the bracken fern, but it was much clearer in the forest and on the upper slopes, where it led over elevation after elevation, which, seemingly small and smooth from a distance, are in reality quite rough and formidable. These upper parts which had at first appeared to be rounded grassy hills, are largely covered with blocks of sandstone rock, between which the long grasses and

sedges grow. Various flowering plants, and especially orchids, were to be seen about the slopes, the most common being the brilliant *Epidendrum elongatum* with its varying tints of white, pink, yellow, deep red, purple and magenta.

Here and there, where shallow depressions occur, were swampy patches, conspicuous, even at a distance, from the yellowish tint of the leaves of *Brocchinia reducta* which grew luxuriantly in all such places. Above followed the larger swampy area, which has been termed from its botanical richness, the "El Dorado swamp." Here the prevailing wealth of colouring was furnished by the exquisite violet-flowered *Utricularia Humboldtii;* but there were crowds of other flowering plants, and among them species of *Pogonia, Heliamphora, Oncidium, Zygopetalum, Epidendrum, Selenipedium, Xyris, Pæpalanthus, Drosera, Stegolepis,* etc. Here, too, *Brocchinia reducta* formed its yellowish patches, and with *B. cordylinoides*, occasionally gave support to Utricularias which grew in the water stored in the axils of their leaves. The large spiny rosettes of *Abolboda sceptrum*, also, with their long dried flower-stalks, were everywhere visible.

There was a sad change in this oasis of flowers before we left Roraima. Our Arrekunas who seemed possessed with the idea of burning the grass wherever there was a chance, had unfortunately lighted a fire in the dry grass below, and it spread all over the face of the mountain, utterly destroying the beauty of the El Dorado swamp.

In a small valley to the east, at the edge of the forest, SCHOOLMASTER pointed out the usual camping-ground of former visitors, at a height of 5,400 ft.; but my desire was to build our rest-house, as it may be termed, as close

as possible to the vertical wall in order to shorten to the least possible the time occupied in the ascent to the summit. Extensive examinations by the brothers SCHOMBURGK, APPUN, and IM THURN, had been already made of these lower districts, and it was my object to do as much as possible on the summit itself. No doubt a very considerable amount of work yet remains to be done on the slopes, but such work, from what has been already done, should extend over many periods of the year, to be really satisfactory and at all complete. The difficulty, however, would be very considerable.

Where the track entered the upper or second forest belt which clothes the upper slopes right to the vertical wall, it was still sufficiently open to be recognised by the Indians, though it was very much overgrown, more especially by the densely matted bamboo which is so common in these lower parts. Several plants of *Leiothamnus Elisabethæ*, with its large crimson flowers, grew along the track; and on the moss-covered branches of the trees were seen many of the lovely red flowers of the delicate *Utricularia Campbelliana*. Here, too, for the only time, I met with two specimens of the pale cream-flowered Utricularia that had been found by RICHARD SCHOMBURGK, and unfortunately lost by his boy, as he relates.

Crossing a small stream, the waters of which were, as one would expect, deliciously cold, the trail led very steeply upwards for some distance. Here the lovely red Utricularias on the branches, and many orchids and ferns on the ground, are met with abundantly; while above the very steep ascent come rocky stretches where the forest is

open and stunted, and the large Brocchinia *(B. cordylinoides)* and the Stegolepis *(S. guianensis)* grow profusely, falling over the track, and almost obliterating it.

From the top of some of the large boulders along this tract, magnificent views of the open country below are obtained, numerous elevations breaking the general evenness of its extent; and the great bare wall of the mountain is seen rising from its vesture of green, imposing and grand beyond description. Here, too, one can observe clearly the nature of the ledge along which one makes the ascent to the summit. This ledge is in reality but the oblique, broad, basal part which has been left by the falling off of a large upper portion of the mountain, along which vegetation has spread from above and below; and it is quite uneven and irregular throughout its extent.

Above this open region of Brocchinias, one enters a densely grown and rocky tract, where one species of palm *(Geonoma Appuniana)*—the only palm found on the slopes except a few stunted specimens of *Euterpe edulis* which are seen lower down—gives the prevailing character. Here, close by the rocky bed of a small stream which at the time filtered its way below the surface, at a height of 6,400 ft. (1,000 feet higher than the camp of any former travellers), I judged that a suitable place for our station could easily be made. Accordingly, next day, about twenty of our bearers were occupied in clearing a very wide tract close to some massive boulders where the sunlight and the breeze could penetrate and have full play on the dank atmosphere.

Such a wide clearing was indeed an essential for health. Owing to the height of the palms and forest trees, and the extreme dampness of the dense covering

of living and decayed vegetation on their trunks and on the ground, the air itself was so confined and saturated with moisture that an ordinarily small clearing would hardly have affected it. As it was, when late in the afternoon we left for the village below, not only were our two sheds built, which would afford at least shelter from wind and rain, though not from cold, but our open site commanded a wide aspect of the sky, and even of the horizon, whence the bright sunshine and the breeze, which had played upon it since midday, had converted an oppressive mugginess into a fresh and bracing atmosphere.

Luckily, although clouds and mists had drifted over, causing the finest drizzle, none had settled on the slopes, and we had thus reaped the full benefit of the sunlight; and the vast curtains and garlands of wet mosses and selaginellas which had been torn down, had become almost entirely withered and dried.

On Tuesday morning we carried up all that we should need for our work, and a large quantity of provisions for ourselves and the Indians who had elected to go to the summit with us. A few of the bearers disliked the idea of climbing even the slopes; others did not mind going to the camp, but had no desire to go further; while but very few cared to climb to the summit; and of these but four, two Makusis and two Arrekunas, eventually decided to sleep on the top with us.

Before leaving the settlement we had made arrangements with JEREMIAH, the Arrekuna chief, to supply those of our people who remained below with food till our return, and had bought up all the available cassava, yams, pumpkins and other provisions, besides a large quantity of paiworri. Our huntsmen, too, had been sent out the day

before for "meat," but they had all returned empty-handed.

On reaching our camp three of the Arrekunas were sent on to clear the track right up to the ledge, the two others and the Makusis completing the arrangements for sleeping and food; and when the night fell, our clearing was brilliantly lighted by the fires on which they depended for warmth. Towards morning, however, it became bitterly cold, the thermometer having fallen to 50° F.; and we were all glad when dawn at last broke, though it was not till much later that any appreciable difference in the temperature took place. Hot cocoa and hot ginger tea, in the meantime, worked a considerable change in our sensations, in spite of the slight rain which fell and delayed our start for the summit. The cold had been very trying to our Indians, who, at a temperature at night of 54° F., in the village below, had yet been protected by an enclosed house, thoroughly warned by numerous fires.

To get some general idea of what would be required for camping securely on the top, and the possibility of taking up loads, we had determined to go up, and to return the same day to our station, and then to take up next day, if it were found possible, all that was necessary for our purpose. Being thus unburdened we were quite prepared for whatever difficult climbing there might be, but, as we found out, we might just as well have taken up at once what we needed, since, although the track was very steep and slippery in many places, there was practically none of it that could be considered really dangerous, or that required more than an ordinary amount of time and care on the part of a fairly strong and active person.

The walking was certainly tedious and difficult, for on this upper part of the slope, and on the lower part of the ledge, close to the cliff, boulders of all shapes and sizes, which in the long course of time had fallen from the precipitous walls, lay piled about in all directions ; and the palms and other trees which grew between or on the top of them, with roots and branches closely or inextricably intertwined, afforded but a treacherous matted floor, where pitfalls were frequent under the deceptive covering of rank mosses, filmy ferns and miscellaneous vegetable debris. The slippery mud resulting from the decomposed shales and vegetable remains, gave also but an insecure footing in the steeper places, softened as it was by the prevailing humidity.

Over, under, or between the rocks, branches, trunks and roots, we made our way to the base of the vertical wall, where we found the height to be a little more than 7,100 above the sea level. In the gloomy dank shades of the dense growth of palms, not a flower had been seen, but a rich luxuriance of mosses and ferns everywhere met the eye. About midway up the ascent from our camp we had passed over the top of a huge mass of boulders through a wide rocky archway, where a small company could easily have camped in security, with a little additional shelter from the wind. Under the archway, where a few initials were marked on the rock, the sandy floor was quite dry, in spite of the showers that had lately fallen and of the moisture of the surrounding forest. Here, too, altogether magnificent views were obtained of the country below from the upper rocks—views that were much more pleasing as to details than those from the summit, from whose great altitude the lesser heights on the savan-

nahs became, as it were, depressed into the general level.

Standing close by the bare wall one notes at once, as SCHOMBURGK and IM THURN have related, that the upper part projects a little, and that where water drips down from the edge, it falls outside, a few feet from the base. This, of course, is due to the more rapid denudation of the softer lower layers. Pieces of diorite which forms the basal bedded rock of the sandstone pediment, are also common; but they are almost covered over by the sandstone boulders which have fallen from the summit and cliff. Among these, a few bushy plants grow, the most remarkable being a familiar-looking blackberry *(Rubus guianensis)*, the ripe black fruit of which was deliciously sweet, though the hard red heads were as sour as they could be.

As one looks up at the enormous walls, it is easy to distinguish the bedding of the red sandstone, with grey and whitish mottlings here and there and dense shaly layers, and to note the irregularity and roughness of the face of the cliff; while on the jagged edges of the summit, a few straggling bushes can easily be made out. Here and there, too, are seen small water courses, where the rock is vertically bathed with moisture, and these, no doubt, in the wet seasons, are great waterfalls.

On the face of the precipice, especially where it is most roughened and moist, many flowering plants grow, mostly out of reach, but one of these with small golden flowers *(Cambessedesia Roraimæ)* we managed to secure.

Our track along the ledge led us at first close inside by the base of the cliff; but, further up, the boulders here became so huge that we found it easier to skirt the

outer side. There is no risk at all in doing this, for the so-called "ledge" is no narrow shelf, such as it seems to be from a distance, from whose edge there is any possibility of falling, but a wide and extensive passage, which has been formed by the disintegration of the upper portion, and about which one can pick one's way safely between the tall grass, bushes and trees with which it is covered.

On various parts of this lower ledge we met again the crimson *Leiothamnus* and an abundance of ferns, mosses and lycopods; but the most beautiful flowers were those of the delicate *Utricularia Campbelliana*, whose brilliant red hues among the mossy covering of the various tree trunks, often rivetted one's attention.

Before reaching the gully in which the Roraiwa-paru falls, there is a sudden break in the path, where a sandstone ridge rises for about 9 ft. sheer, up which we clambered by means of sticks placed like the rungs of a ladder in a corner of the ridge. This was actually the only really serious obstruction in the ascent; and though the rest of the path was generally very steep, the rocks and vegetation around usually afforded opportunities for hauling oneself up.

From an almost treeless, rounded ridge above this break, we obtained a most magnificent and commanding view, not only of the great red walls and broken tree-clad ledge beside us, but, more especially, of the green forest and yellowish savannah slopes, stretching down to the open plains more than four thousand feet below, and thence right away to the horizon. From such an elevation, the illimitable expanse of mountain, valley and plain, set out like a parterre of green

forest, yellow grass and blackened rocky patches, with varying tints and lights and shades, held one with a sort of fascination that required some effort to dispel. Of all the strange and wonderful pictures of scenery on which we had gazed, this was undoubtedly the most completely beautiful. From the summit, the views of the country below are even more extensive, but they lack the features of the sloping forested base and the red walls, which are hidden by the projecting edge; while from the greater height, the mountains and the savannahs appear to be more or less continuous in one general level.

From the elevated ridge we descended into a wide and open ravine, and on reaching the opposite crest, beheld before us the deep gully of the Roraiwa-paru. A tall and coarse grass grew down the side, but there was no difficulty in the descent, nor in crossing the wet rocky bed on which a little water fell from above like scattered rain drops. Outwards, the channel slopes steeply down between the precipitous outer cliffs. The further side of the gully rises steeply by a series of smooth and slippery-looking, bare, step-like ledges, which are constantly wet, not only from the drops which are blown upon them from above at intervals by the wind, but from the drainage of the higher parts.

Climbing carefully over these smooth ledges, we found that though they were covered by a jelly-like slime, they were not slippery; and the ascent was therefore comparatively easy. Had they been really slippery, their descent, at any rate, would have been attended, owing to their steepness, with considerable danger.

In first glancing at the vegetation on this higher part

of the ledge, even right to the very entrance of the gorge by which one reaches the first open valley on the summit, it almost seemed as though we had been suddenly put down again on an "El Dorado swamp," but one on which the vegetation was considerably more rank. Here were the great Brocchinias and yellow-flowering Stegolepis, the rosettes of Abolboda—still with dried flower-stalks—the delicate pinkish pitcher-plants, and hosts of smaller species among them; while a pink Befaria, a vivid scarlet Ledothamnus and a pendent red Lisianthus, replaced the brilliant orchids of the lower slopes.

And then we entered the gorge between the blackened sandstone rocks, on one of which, high up, the desecrating hand of an orchid collector had painted in bold, white letters, "Use PEAR'S Soap."

In completing this very succinct narrative of our journey to the summit of Roraima, it is not my intention here to dwell upon the various interesting physical features, which claim notice. Considerations of space alone altogether forbid; but a few words must be said to indicate to what extent our longer stay on the plateau enables us to supplement the generally very accurate description given by Mr. IM THURN.*

We had reached the summit just after mid-day; and as the weather was quite clear, had ample opportunity of making a cursory examination of its main features. Other than the scarcity of food, there was no evident reason why we should not pass the night on the top; and LLOYD and I determined to do it, making the best of the small quantity of cassava and butter which remained from our breakfast, until MCCONNELL, who kindly un-

* *Timehri*, 1885, p. 1.

dertook the arduous task of going down again and returning next morning, should arrive with supplies.

True we had neither coat, blanket nor tarpaulin; but by making a rough framework of the branches of the common Bonnetia trees against an edge of a series of overhanging rocks, and covering them over with Bonnetia bushes and whole plants of Stegolepis and Brocchinia, we secured sufficient shelter to break the force of wind and rain. A large fire of dry Bonnetia and Crepinella branches which we had stored, was kept brightly burning all night at each end of the little hut; and lying close against each other on a flooring of Bonnetia leaves, listening to the beating of the rain and the endless whistling of the high winds which sighed among the leafless under parts of the Bonnetia branches as though they were but so many Æolian harp strings close outside, and then from the echoing sides of the terraced basin soughed recurrently like the distant murmuring of the surf upon the shore, we found it hard to realise, even amid such strange surroundings, that we two were lying, shut off from all other human kind, on the summit of Roraima.

We had hoped that, after making our hut and storing our firewood in careful preparation for the night, we should still be able to wander about by the late evening light, and even perhaps by the bright moonlight; but long before sunset the clouds grew heavy, and the cold mist and rain, driven fitfully by the rising winds, compelled us to take refuge in our quarters, and closed our work for the day.

Our morning hopes, too, were blighted. Instead of the clear skies which had hitherto greeted us on rising, the shifting mist obscured the dawn; and coming from our

comparatively warm hut into the raw freshness of the open air, we were so chilled in a few minutes through our thin clothing that it was altogether unbearable, and again we were driven back for the sake of warmth. A glance at the thermometer had shewn us that the temperature outside was 49° F., the minimum having been 47° F., and clad as we were in single pyjamahs or shirt and trousers, it was not till nearly eight o'clock, when the mist had largely cleared and the temperature was at 52°, that we were able to begin our detailed hunt for animals or plants that had not been gathered the day before.

The under vegetation, consisting chiefly of dense masses of mosses, and many species of Pæpalanthus Xyris, and other small plants, is moist and peaty, little streamlets of water running all through it towards the lower basin: and, walking through this spongy carpet, we were soon wet through, high up the leg, and miserably cold. Later the sun came out, but dense mist constantly passed over and compelled us to keep within a moderate distance of our shed, where, as a safeguard, to indicate its position to McCONNELL, we had slung a small towel out of my cartridge bag as a flag from one of the tallest Bonnetia trees, visible from the entrance of the gorge.

Meanwhile we clambered among the huge blackened rocks, which have been worn into all sorts of fantastic shapes by the agency of wind, rain and heat, and collected all the most desirable specimens we could find, crossing through the shallow pools in the deeper basins, and laboriously ascending the highest points. In whatever direction we looked, the general aspect was much the

same—though the rocky area is infinitely variable—a succession of blackened, elevated ridges, irregularly terraced and rugged, and often broken up into isolated peaks of piled rocks, alternating with equally irregular, winding valleys or basins, in which lie small, shallow pools with narrow streamlets. These various streamlets run in all directions towards the edge of the plateau, frequently joining to make larger streams, visible from below as waterfalls according to their bulk, and swelling after the slightest rains.

The most distinctive feature of the vegetation, which is quite dwarfed on the open parts of the exposed basins and along the edges, and almost entirely absent from the summits of the main ridges, though found to be often of quite a luxuriant character in the more sheltered central basins and on the western slopes of the inner ridges and peaks, where it is less exposed to the driving winds and mists, is certainly *Bonnetia Roraimæ;* and this is the only plant that grows to any size in the exposed basins, attaining a height of from 4–20 ft., according to its position. Its tiny leaves are tufted quite at the top of its long, bare, blackened branches, and the plants thus give a very peculiar aspect to the scenery. More centrally on the plateau, these trees reach in places to from about 20 to 35 ft., and other kinds are met with, but in positions that are difficult of access.

The general vegetation recalls that of the upper part of the ledge. The two species of Brocchinia, the Abolboda, Stegolepis and Heliamphora, are very common; and mingling among them, occur the lovely pink Befaria, the scarlet Ledothamnus and the red pendants of *Lisianthus im Thurnianus*, with many others; while the

beautiful crimson *Utricularia montana* is a distinct feature even amid this gorgeous colouring.

Of the many new species discovered on the summit by Mr. IM THURN, we obtained several, if not all; and many other species besides both of ferns and flowering plants, some of which had been obtained by him on the slopes below, while others are certainly new to our Flora.

There was of course always the possibility that the clouds which frequently passed over, might permanently settle; and as this would most likely result in our losing the way to our hut, it was not pleasant to contemplate—more especially when we were separated, the one in the valley, and the other high up on a terraced ridge, where I was striving to reach some very tall tree-like ferns that grew on an apparently inaccessible ledge. Over and over again I had been driven back by the increasing denseness of the clouds on the height, and had sung out to LLOYD below to get his bearings, when suddenly MCCONNELL'S voice sounded about me, echoing from the cliff in front; and looking back, I beheld him, right across a wide open valley, on a lower ridge, whence his voice had so distinctly reached me. This intensity of the voice across the long distances of the wide open valleys, is peculiarly great on these terraced heights.

Fortunately MCCONNELL was none the worse for his arduous double journey. The worst part of it had been in the descent, when from the steepness and slipperiness of the track in many places, he had found it more convenient, if not indeed safer, to simply squat and slide down, using his hands as brakes, rather than to step in the ordinary way; and this, too, we found our most satisfactory plan when later we made our descent. In

going down such steep slopes, MCCONNELL'S tall figure put him, moreover, somewhat at a disadvantage. His great height had been a constant source of surprise to the people at the settlements, where, when they had become accustomed to us, they often surreptitiously stole up close behind him to measure how far they reached up his body, and even ticking it off on a stick, no doubt for the purpose of showing to others this proof positive of the size of the great "Paranakri," who certainly will long figure in their tales and songs.

The Indians had not apparently experienced any very great difficulty in bringing up their various loads of hammock bags, drying-press for plants, camera, provisions, and other requisites, though naturally enough they must have disliked it. Nor indeed did they seem to suffer in the descent.

In fact the difficulty of the exploration of the summit of Roraima, when once a rest-house has been built close up to the ledge, as was proved by us to be both possible and safe, lies, not really in the difficulty of the transportation, but in persuading the Indians to do it, and in getting a sufficient number of them to remain on the top, so as to be able with sufficient time to move from camp to camp towards its distant angles, by which method alone can satisfactory examinations be made. As was shewn by us, it is easy enough to put up a temporary shelter of tree branches against overhanging rocks, with moderate security, if not comfort, against bad weather or extreme cold. Hammocks, it would be of little use to take up: thin waterproof sheeting for covering the ground and for additional shelter, and blankets, are all that would be necessary or advisable.

With the exception of the four who were to pass the night with us, our bearers went down after our late breakfast; and as the weather was bad and threatened to be worse, we spent the time enlarging our hut and making it more secure. Owing to the general mistiness it was out of the question to range very far away, nor was McCONNELL able to use his camera; and when the day closed in rapidly with denser mist and rain, though practically no wind, we were forced to retire into our hut, long before sunset. Our Indians had not built any shelter for themselves, but lay under the widely projecting rocks, rolled up in the waterproof sheet which they had brought up for us.

The morning broke, to our infinite satisfaction, bright and clear; and we determined to make the most of it: McCONNELL photographing; LLOYD collecting whatever he could find desirable; and myself attempting to range towards the north-east as far as I could reach—each with an Indian accompanying him. The minimum temperature at night had again been 47°, and the air was still very cold; but we now had our coats.

The Fates, however, were against us. Just before we were ready to start, several of our bearers came up from the village to tell us that they all wanted to go away, that the Chief JEREMIAH, in spite of the promises made to me, had given them no food, and that the Arrekunas were trying to kill them: and that therefore they wanted us to come down. Knowing full well that with this idea in their heads, we should lose the greater number of them unless we descended, we reluctantly promised to be down by the evening. In fact, it was really a sign of great friendship that they had in thus

faced the mountain they dreaded, instead of taking French leave, as usually would be the case.

The great disadvantage was, of course, the absence of our personal control from among them. True it might have been obviated by dismissing the greater number, or all, of those who were not willing to go to the summit, but this would have necessitated practically double pay for the journey, while some long time might have been spent afterwards in procuring new bearers—time that could not under the circumstances be spared, considering that the most important part of the work of the expedition yet awaited performance in the neighbourhood of Kwaimatta before the advent of the Christmas rains. On any expedition undertaken solely for the exploration of Roraima, this would obviously be the wisest arrangement: in our case Roraima was but an incident of the general expedition.

Though our plans for the day were thus curtailed, we yet managed to add considerably to our knowledge before going down. MCCONNELL secured an interesting series of views illustrative of the varied physical features of the plateau, such as the general appearance of the terraced ridges, the open valleys, the fantastically shaped rocks, the prevailing vegetation, and our camp surroundings. LLOYD collected additional specimens of the flora and fauna, and at the same time planted the Union Jack on some of the chief heights on the western side; while in my eastward excursion I was able not only to ascertain the heights of the great ridges and the depths of the valleys, but also to observe the character of the vegetation near the central districts, and to gain information on many other interesting points.

Three of the highest ridges rise almost exactly to a height of 8,740 ft. at their highest points, which by ærial denudation have been left as isolated peaks. From the top of one of these on the N.W. edge a very good view of the top of Kukenaam was obtained; and it was evident that the general character of the summit of that mountain was but a reproduction of that of Roraima, though at the time the greater part was obscured by the dense clouds that hovered over the gorge between the two mountains. From the more central peaks the aspect of the whole plateau is that of an almost absolute desolation of bare and blackened rocks, ridges and peaks, all appearing as barren as though a great conflagration had swept all over them; though in the deeper valleys, which are in some places cut down quite 400 ft. below, a comparatively abundant vegetation exists on the western slopes of the ridges, to which leaping cascades and small waterfalls from the heights above, add pleasing and picturesque features. Nowhere, however, is there any true forest to be found, only a few high bushes and trees occurring here and there amid the rank undergrowth, which often rises above one's head, and, from the roughness and irregularity of the surface on which it flourishes, presents serious obstacles to its penetration.

Though the valleys are very deeply excavated in many places, the pools of water which are scattered about are nowhere of any great depth, the deepest observed being about 5 feet; while the great majority are quite shallow, being simply slight, and generally gravelly, depressions of varying sizes along the channels by which the water finds its way to the edge. Nor indeed can water collect to any extent in any of these valleys, before it is

carried off by these abundant drainage canals which are to be found all over the surface. In many of the shallow depressions great masses of confervæ flourish, while frequently the whole surface of the valley is composed almost entirely of large and small quartz crystals, loosely scattered or in massive heaps.

On the northern side there appears to be quite a deep and wide gorge extending almost across to the south-eastern face, in which the clouds lie densely while the rest of the mountain is quite clear, just as they usually do in the Kukenaam and Roraima gorge; and it was noticeable, too, that from the S.E. face, the plateau slopes gradually down to the western side. Perhaps herein lies the explanation of the lesser elevation of Kukenaam.

From what has been already stated, it will have been gathered that the summit of Roraima is not comparable to a general basin, since its whole extent has been worn down by ærial denudation into great series of irregular and multiform, terraced ridges and peaks, with winding valleys of varying depth and width as draining channels all over the surface to the edge. The apparent uniform height of the more massive peaks appears to indicate somewhat of the former level of the plateau, the varying hardness and texture of the beds of red and white sandstone and shale having given rise to the multiplicity and peculiarity of shapes and sizes met with, both in the ridges and peaks, and in the individual rocks themselves, which frequently strangely resemble the forms of animals, and miscellaneous objects in general.

But for the coolness of the air, the temperature at midday being 64.5° F., the walking over these rugged rocks

would have been altogether intolerable. As it was, it was chiefly trying on account of the frequent ascents and descents over and between rocks and piles of rocks, terraces and buttresses, and precipitous escarpments, where frequently detours of several hundred yards had to be made in order to pass by some deep but very narrow ravine, or of more than a mile to skirt some valley chasm, whose sides were but yawning precipices. In the more open valleys, too, the difficulty in avoiding the very cold water in the various pools was not much less tiresome.

As can readily be understood, though the ground covered and the time occupied were both considerable, the real distance in a horizontal line was often very little ; and though, as a matter of distance only, a walk from one end to the other of Roraima, and back, could easily be accomplished in one day, yet under the conditions that really exist, several days would necessarily be required, even without making allowances for collections or examinations of objects on the way. For the thorough examination of the flora and fauna, also, a very considerable length of time would be required. The plants as a rule can easily be found, but many of them could only be obtained after a very considerable amount of climbing—often in places that are risky and dangerous ; while the animal forms necessitate a good deal of seeking, and even when seen are not easily procured.

The animal forms naturally claimed a good proportion of my time, the more especially since none of them had previously been collected. Anything that we could secure therefore would be of special interest. By the aid of the Arrekunas, two species of birds which are certainly residents on the summit were obtained ; the one *Diglossa*

major, occurring also on the slopes below; while the other is closely like a small specimen of *Zonotrichia pileata*. A large green humming-bird, too, with rufous throat, had been seen by us in the early morning, perching just above our camp, and also a little wagtail, as we thought, close by the margin of the pools; but at the time there had been no chance of shooting them. Overhead there circled a large white-bellied hawk, which had also been frequently noticed from the slopes below, so that the species could hardly be regarded as a resident on the summit.

Of reptiles and mammals none were met with. There were, however, numerous large holes in the sandstone in which such animals might have taken refuge, and in fact the fæces lying close by one such hole was unhesitatingly pronounced by the Indians to be those of an armadillo. Even dynamite, however, failed to reach far enough to secure a specimen.

Perhaps the most noticeable forms are the larvæ of two species of dragon-flies, which are to be found in nearly every pool of any size. Viewed from some little height, they appeared like so many small fishes, and they were frequently responsible for tiresome climbs down the valleys to determine their exact nature. The adult forms were occasionally seen settling on the little bushes or on the black rocks, where also many little black butterflies were common. These latter were certainly common also on the slopes below.

The most interesting creature, however, was a little new Batrachian which Dr. G. A. BOULENGER, F.R.S., has described under the name of *Oreophryne Quelchii*, the new genus Oreophryne being founded for its recep-

tion.* This little frog has just the aspect of a small black toad, and though it occurs commonly on the slimy wet areas, or by the margins of the very shallow pools, it is yet most difficult to distinguish it from the little pieces of blackened sandstone rock which it so perfectly resembles. The under side, however, is very brilliant, being mottled on the throat and belly with bright yellow.

In the dry niches and moist crevices of the rocks, several species of spiders, two Myriapods (Polydesmus) and a little crustacean—apparently a species of Oniscus—are to be found; while a few earthworms are met with in the moist peaty covering, and some small aquatic insects in the pools, where they are very difficult to secure. Four beetles of four species were collected, and it is remarkable that they are all new to science, the more especially that a new genus, Charagmophorus, has had to be founded for one of them. They have been named by Mr. CHARLES O. WATERHOUSE as follows.† *Rhantus elegans*, *Charagmophorus lineatus*, *Heterocrepidius Macconnelli*, and *Cryptocephalus Quelchii*. As these beetles are at present the only Invertebrates that have yet been worked out, the result is a remarkable one, and would seem to indicate a very marked degree of isolation for this summit fauna.

As has already been indicated in the foregoing pages, the thorough exploration of the summit, and the detailed collection of the specimens of its fauna and flora, would occupy a very considerable time, and would entail great hardship, privation and expense: but as must also have been gathered, the results would be, in the highest

* Annals and Magazine of Natural History, June 1895, p. 521.

† Ibid p. 494.

degree, interesting and important. The difficulties are certainly great, and should not be lightly faced; but if the various suggestions made as the result of our own experience, be followed, there is no real reason why the object should not be satisfactorily and safely accomplished, the main camp being pitched actually on the summit itself, provided it be during the dry season. As was to be expected, wider knowledge tends largely to dissipate the atmosphere of impossibility that has for so long hung around the famous mountain.

Our departure, however, was now at hand; and after spending two days in the village, making final arrangements for the return, we were soon *en route* for Kwaimatta, following a new track between the Kotinga and Ireng rivers, the former being crossed at Kalisha-sararu, below Orinidoui, and the latter again at Karona.

Considerations of space forbid any further reference here to the various incidents of the return, and to various other matters in relation both to the people at the mountain and on the journey, as well as to the agricultural, industrial and economic aspects of the country generally; these must await further opportunity. But here at least I must make the very heartiest acknowledgments to MCCONNELL of his ever ready co-operation in work and funds, without which the trip, such as it was, could not possibly have been carried through; also to LLOYD who took entire charge—among other things—of the drying of the plants; and to LENNOX as well, who not only compiled a Makusi vocabulary, but undertook, towards the close of the expedition, the collection of the living orchids.

In giving this simple and condensed narrative of the

journey to the summit, it has been found impossible to do more than touch briefly on many points that deserve fuller notice, while many others have been quite omitted; but it is hoped that, even as an incomplete record of travel through an interesting country and among an interesting people, it will yet be of use to others who may follow in our tracks, either actually or in imagination.

Report of Society's Meetings.

Meeting held Jan. 10th.—Hon. E. C. Luard, President, in the chair.

Members present 19.

Elections.—*Member:* Mr. Francis Harvey.

Associates: Messrs. Herbert Fredk. Harcourt, William McCreath, A. G. Chapman, A. Outridge, James W. F. Aird and William Miller.

The Treasurer laid over his financial statement for 1894, showing a balance in hand of $965 47; in accordance with the rules this would be audited by two of the Directors and brought up at the following meeting.

The following report of the Agricultural Committee for 1894 was adopted, and a vote of thanks accorded to the Committee.

Georgetown, Jan. 8th, 1895.

To the President and Members of the
Royal Agricultural and Commercial Society.

Gentlemen,—On behalf of the Agricultural Committee of the Society I have the honour to report as follows for the year 1894:—

During the year they have held meetings once a month, at which, however, they are sorry to say but few of the Members attended regularly and some not at all. That for June was held at the Botanical Gardens, where those who attended were shewn round the experimental plots by Professor Harrison. The Committee could not but notice the effects of certain manures as compared with others, especially the advantage of ammonia over nitrate of soda and phosphates. They were also much interested in the seedling canes which numbered something like three hundred varieties.

In compliance with the request of the Committee the Government have been pleased to allow articles of general importance to be examined by the Government Chemist, for the Committee, free of cost, provided the Government Chemist is satisfied that the analysis would

be of benefit to the Colony at large and that the results be made public.

At the request of the Committee the Government also supplied them with fifty copies of Messrs: Jenman and Harrison's Report on the Agricultural Work in the Botanic Gardens for the year 1891-2, which they distributed to agricultural members of the Society.

At the different meetings the following matters were considered:—

A pamphlet containing Information for Emigrants to the West Indies; A proposed "British Guiana Tobacco Factory"; Caramel and Rum Colouring generally; The Polarisation of Sugar; Food Adulteration; The Tricosphæria Cane Fungus; and The value of Plantain Starch.

They have reported to the Society on the Caramel Premium, and also on two cases of cane fungus, examined by Professor Harrison under the Government regulations.

S. R. COCHRAN, Secretary.

The Secretary reported the election by the respective Committees of the following Office-Bearers for 1895:—

Agricultural Committee—Chairman: Hon. B. Howell Jones; Vice-Chairman: Prof. J. B. Harrison; Secretary: S. R. Cochran.

Commercial Committee—Chairman: J. H. de Jonge; Vice-Chairman: A. Summerson; Secretary: J. Y. Baldwin.

Book Committee—Chairman: Dr. F. H. Anderson; Vice-Chairman: G. B. Steele.

The President addressed the meeting as follows:—

Gentlemen,—It has been the custom for the newly elected President of the Royal Agricultural and Commercial Society of British Guiana, to make a short address at the first meeting over which he has the honour of presiding, and in accordance with this time-honoured custom, I now propose with your kind permission to say a few words.

When I recall the fact that the Presidential seat of this Society has been so ably and admirably occupied over and over again since its formation and institution in 1844, by such eminent colonists as Sir Michael McTurk (its first President), Messrs. Manget, Garnett, Perot, E. G. Barr, McCalman, King, Field, Russell, Drysdale and many others, who

are alas no longer with us, I am deeply conscious that the duties before me are no light ones if they are to be conscientiously and successfully attended to—attended to and performed with your kind assistance in such a way that when my term of office expires, I may hand over the Presidential reins to my successor with the Society in as flourishing a condition as it is now, and with the record of as successful a year's work behind me, as our worthy Vice-President may congratulate himself has been a marked characteristic of his Presidency. But, to repeat what perhaps you have often heard said before in this room, a President of the Society if he is to be a useful one, must have the generous support of the members, and one way in which that support has been lacking during the past year, is, that when gentlemen have taken the trouble to prepare interesting papers on subjects in which this Society is deeply interested, and have come here to read them, there has only been a very small attendance of listeners. It goes I think without saying that if gentlemen found their papers appreciated by an attentive audience others would be stimulated to come forward and help in this direction, but as matters now stand it is only with considerable difficulty and after much persuasion that (with few exceptions) gentlemen can be induced to give us the benefit of their experience and special expert knowledge, in one direction or another, and consequently and most regrettably, large stores of valuable information remain withheld from the Society.

I trust that we shall be able not only to continue the evening science lectures, but also that gentlemen will come forward to read papers at the monthly meetings. Four gentlemen have already been approached to this end, namely Mr. Luke M. Hill, Mr. Douglas of the Diamond, Mr. T. B. Younger and Mr. Seedorff.

Gentlemen, I think the members of this Society have much to congratulate themselves on when they turn to the admirable Journal which continues to be put forth under its auspices and the able editorial guidance of our Librarian Mr. Rodway, and formerly conducted by the Curator of the Society's Museum, our esteemed friend and colonist Mr. Quelch. No doubt that gentleman when he returns from his trip in the interior will receive a warm welcome and be able to tell us much that is interesting and instructive, and will kindly give us not one, but several lectures on his recent experiences and adventures in the interior of this magnificent Province. The amount of useful and excellent information which is stored away in the volumes of

Timehri, is remarkable, and I earnestly hope that during the coming year, the Editor will find no difficulty in obtaining MSS. of suitable and varied character so that the high standard of the Society's Journal may be more than maintained.

The Museum of the Society continues to be as attractive as ever, it is to be hoped that during 1895 many additions will be made by the help of Members and others.

I was reading in the *Nineteenth Century* the other day, that since 1860, when the rise in the popularity of Magazines and Periodicals set in, a popularity which has increased by enormous leaps and bounds as you are all aware, the bookseller's business has become less and less lucrative, until at the present day standard works which our grandfathers would never have been without, are seldom asked for at Provincial Libraries; after reading this I could not help wondering if fewer demands were now being made on this Society's Library than heretofore, and am glad to say that our indefatigable Librarian Mr. Rodway has assured me that great as is the demand for the periodicals, the favour in which the contents of the book-shelves is held is in no way diminished nay rather increased. I find that new books to the value of $769 were added to the Library last year, Periodicals absorbing $744.

The Financial position of the Society, Gentlemen, as the Honorary Treasurer's explicit statement on the table will show you, is satisfactory. The Society is never overburdened with surplus funds, but pays its way. I trust we may see the number of Lady Subscribers largely increased this year.

You are all aware what a dark cloud is now passing over our colony, and when we see once flourishing estates either abandoned or sold for less than their mills cost, one cannot help a feeling of intense anxiety as to what will be the end.

Speaking for myself Gentlemen, I feel thoroughly confident that the storm will be weathered and that the Sugar Industry of the colony will again enjoy prosperity, if not a prosperity equal to the past, still a reasonable prosperity. Able writers in both the *Argosy* and *Chronicle* newspapers have lately forestalled the remarks I had intended to make about Central Factories, but I may say I look forward confidently to the time as not being far distant, when an East Coast and West Coast Central Factory will be started, to which Proprietors will be able to sell their canes at a profit; it may interest those present and others to know that the outlines of a scheme are now being discussed.

It does not seem at all likely that we shall see any permanent rise in the market value of our produce, and we should be very foolish to count on such, at the same time there is perhaps some very slight consolation in knowing that the German and other beet sugar producers seem to be in as bad a financial position as their confreres in Demerara. At a recent meeting of the Reichstag in Berlin it was admitted that they were losing £2 a ton on their sugar in spite of the Bounties.

At present Demerara Planters are being favoured with fine weather and to some extent rates of wages for tillage operations have been reduced to more reasonable rates than have prevailed for a considerable time, but proprietors distinctly realize that unless their estates can make sugar for $50 to $55 a ton 1st sugar, in unfavourable as well as favourable seasons, it is almost hopeless to continue the struggle. That *some* estates can and will make sugar for $50 to $55 a ton 1st sugar, and even perhaps for less, there is no doubt, but other estates cannot do so as they are at present situated, and I fear may be abandoned unless unexpected relief is obtained. It follows then, Gentlemen, that however much we may deplore seeing certain estates relinquished by their proprietors, under sheer force of circumstances, anything approaching a feeling of panic need not be caused thereby, and those which carry on must combine and help each other to the utmost in the struggle. I said just now that I feared that some estates must be abandoned if "unexpected relief was not obtained" but by unexpected relief I do not necessarily mean loans. No doubt in some cases, a loan at the right time may enable a proprietor to tide over his difficulties, but in this matter of loans the greatest possible discrimination will have to be observed, as there is now ample evidence before us in the colony to show.

The last two Horticultural Exhibitions having proved very successful, it is intended to have one this year, the date of which will be announced in due course. It is to be hoped that residents from all parts of the colony will send exhibits and do all in their power to help the Directors to make the exhibition even more successful than its forerunners.

There is one other matter, Gentlemen, which I think I may mention before resuming my seat, although perhaps it hardly comes within the scope of a so-called Inaugural Address. It is this, that I think we ought to have some memento in this room of former Presidents of this Society who have gone over to the great majority, and to this end I wish now to make an appeal to old colonists to present to the Society any portraits

of former Presidents which they may have. These could be hung up in the rooms and would doubtless be of great interest. A list of the Presidents is now on the table and any donation in support of my suggestion will be gratefully acknowledged. It will be understood that I have referred only to portraits of former Presidents who are now no more.

Gentlemen, I have to thank you for having come here to-day and for having kindly listened to my remarks, and in conclusion feel quite sure, that, if we all continue to take an interest in the Society, and help one another in the discharge of those duties which our membership imposes upon us, the Society will continue to accomplish its mission in British Guiana.

LIST OF PRESIDENTS.

1844 ... Hon. Sir Michael McTurk.
1845 ... „ John Croal.
1846 ... „ William Arrindell.
1847 ... Alexander Macrae, Esq.
1848 ... William Bruce Ferguson, Esq.
1849 ... Alexander Macrae, Esq.
1850 ... Charles Conyers, Esq.
1851 ... D. Macdonald, Esq.
1852 ... Hon. Peter Rose.
1853 ... James Edward Roney, Esq.
1854 ... J. T. Gilbert, Esq.
1855 ... Hon. J. E. Roney.
1856 ... „ William Walker.
1857 ... „ J. E. Roney.
1858 ... Dr. E. A. Manget.
1859 ... Sir W. H. Holmes.
1860 ... S. A. Harvey, Esq.
1861 ... J. T. Gilbert, Esq.
1862 ... Abraham Garnett, Esq.
1863 ... F. A. R. Winter, Esq.
1864 ... A. W. Perot, Esq.
1865 ... Hon. John Drysdale.
1866 ... J. T. Gilbert, Esq.
1867 ... Hon E. G. Barr.
1868 ... G. H. Oliver, Esq.
1869 ... A. C. McCalman, Esq.
1870 ... G. H. Oliver, Esq.
1871 ... Hon. Henry Watson.
1872 ... R. T. Hadow, Esq.
1873 ... John S. Hill, Esq.
1874 ... Henry Watson, Esq.
1875 ... Hon. Wm. Russell.
1876 ... His Honour J. Hampden King.
1877 ... Hon. Wm. Russell.
1878 ... Edmund Field, Esq.
1879 ... Henry Watson, Esq.
1880 ... Hon. Josias Booker.
1881 ... William Russell, Esq.
1882 ... Hon. Thomas Mulligan
1883 ... „ William Russell.
1884 ... „ B. Howell Jones.
1885 ... „ Alexander Barr.
1886 ... „ William Russell.
1887 ... Henry Kirke, Esq.
1888 ... Philip Henry Nind, Esq.
1889 ... G. H. Hawtayne, Esq.

1890 ... R. P. Drysdale, Esq.
1891 ... Hon. B. Howell Jones.
1892 ... „ Arthur Weber.
1893 ... Hon. Dr. J. W. Carrington.
1894 ... R. G. Duncan, Esq.

The meeting then terminated.

Meeting held February 14th.—Mr. Luke M. Hill, A.M.I.C.E., in the chair.

Members present 26.

Elections.—*Members:* Messrs. Manoel D'Ornellas and P. Cressall, Jnr.

Associates: Messrs. Edward Filmer and J. R. Oudkerk.

The Secretary laid over two letters from the Government in reference to the proposed Photographic Exhibition at the Imperial Institute in May next. He stated that the Directors had been making enquiries as to the probability of there being any exhibits from the colony, but had got little encouragement. The only favourable reply had been received from Mr. Fletcher of *Nonpareil.* The Graphic Club had the matter under consideration but had not yet replied.

The Chairman stated that the Graphic Club had decided that they could do nothing.

The Rev. Mr. Ritchie thought it a pity that something could not be done. He had visited Museums and Exhibitions at home and found the colony poorly represented everywhere. He would therefore move that the Society take up this matter and that the sum of Fifty dollars be put at the disposal of a Committee for the purpose of procuring photographs for the Exhibition.

Mr. Quelch said he thought they could get the photos which Mr. Siza sent to Chicago.

The standing rules having been suspended to allow the motion to pass at once, it was carried unanimously, Mr. Quelch, Rev. Ritchie, Rev. Scoles and Dr. Ford being appointed a Committee to carry it into effect.

The Treasurer laid over the annexed statement of accounts for 1894, which was unanimously adopted.

The annexed Report of the Committee of Correspondence was read:—

The Museum, Feby. 14th, 1895.

R. T. A. Daly, Esq.,

Hon. Secty. R. A. and C. Society.

Sir,—I have the honour to state that at a meeting of the Committee of Correspondence held on the 7th inst., Mr. G. H. Hawtayne, C.M.G., was elected Chairman, and the Revd. W. B. Ritchie, Vice-Chairman, for the current year.

I have also to report that active steps are being taken to promote the success of the Annual Horticultural Show, which has been fixed for the 26th August next. Additional prizes will be given this year for (1) Skeletonised leaves, (2) Soursops, (3) Sugar Apples, (4) Custard Apples, (5) Granadillas, (6) Simitoes, Bell Apples or Water Lemons, (7) Breadnuts, (8) Eddoes, (9) Tapioca, (10) Arrowroot, (11) Tous-les-Mois, (12) Vanilla, (13) Honey, (14) Starches in general, and (15) Bee-Hives.

A departure is being made this year in the Show by the addition of a Class to include Poultry and Bees; and in order to secure the best arrangement of Exhibits possible, it is provided that non-perishable articles be forwarded to the Show the day before the Opening.

I have, &c.

J. J. QUELCH,

Hon. Secty. Committee of Correspondence.

Mr. Jacob Conrad gave notice of motion as follows:—

Whereas the Royal Agricultural and Commercial Society of this colony has been established to promote as far as possible the encouragement of, and improvement of Agriculture in all its branches, whereby the resources of this colony are likely to be developed and increased, and also in disseminating of useful information relative to the Industries: and

Whereas such facilities have not been established for either Agriculture or Commerce, etc.—

Be it resolved that the Society deem it expedient to urge on His Excellency the Governor and the Honourable Members of the Court of Policy, the necessity for establishing in the colony a Technical School, in which the children of the colony may receive instruction in Agriculture and other branches of Industry.

Mr. Quelch then gave a long account of his late trip to Roraima and the Savannah region.

A vote of thanks was accorded with acclamation.

The meeting then terminated.

Meeting held April 11th.—Prof. J. B. Harrison, M.A., F.C.S., in the chair.

Members present 9.

Elections.—*Members:* Sir Edward L. O'Malley, Dr. F. G. W. Deane and Andrew J. Patterson.

Associates: Messrs. A. van Schalkwyck, J. R. Oudkerk, Jnr., Jas. C. Clementson, J. Alsing, and William A. Dunn.

The Librarian reported to the meeting that lately leaves had been torn out from several ladies' papers and from "Black and White" either when they were lying on the table or while on loan.

The Assistant Secretary read a letter from Mr. Mr. F. Campen, Straits Settlements, covering the following paper.*

The discussion was adjourned to the following meeting.

* See page 91.

The Royal Agricultural & Commercial Society of British

RECEIPTS.

To Society's Funds, 31 December, 1893			$ 739 82	
„ Refund by Publisher on Sales of *Timehri*, '93			33 48	$ 773 30
„ Subscriptions—				
Lady Members ...	...$	97 50		
Ordinary Members	...	1,805 00		
Country Members	...	390 00		
Associates ...	...	1,177 50		
Arrears	...	7 25		
Associates for 1895	...	5 00	3,482 25	
„ Rents	...		2,599 00	
„ Catalogues	...		8 16	
„ Fines	...		4 20	
„ Interest on Hand-in-Hand Scrip to 30 June, '94 ...	...	42 00		
„ Profit on Hand-in-Hand Policies		1,202 96	1,244 96	
				7,338 57
				$ 8,111 87
„ Balance at Credit Museum Vote 31 Dec., '93 ...	...		$ 1,273 78	
„ Balance at Credit Columbian Exposition	...		402 80	
„ Govt. Vote for the Year	...		4,500 00	$ 6,176,58
„ Govt. Vote for Horticultural Exhibition	...		500 00	
„ Gate Money, &c. ...	...		520 80	
„ Cost of Exhibition to Society...			114 65	1,135 45
				$ 15,423 90

Guiana—Receipts and Expenditure for the Year 1894.

EXPENDITURE.

By Salaries			$ 2,646 00	
„ Periodicals and Magazines ...			731 72	
„ New Books added to Library...	$ 769 24			
„ Less Sales of Paper ...	25 00		744 24	
Subscriptions to English Societies			30 72	
„ Binding			168 32	
„ Award			50 00	
„ Advertising...			131 08	
„ Cost of *Timehri*	547 95			
„ Less Sales by Publisher, $236 75, Less Sales by Stamford, London, $20 94...	257 69		290 26	
„ Repairs to Buildings, Concreting, New Gallery, &c. ...			689 26	
„ Cost of New Furniture, Repairs, Hire of Chairs, &c.			193 56	
„ Insurance with Hand-in-Hand 50,000 at 1¾ per cent. ...			875 00	
„ Postages, Stationery, Petty, Reading and Exchange Room Expenses...			265 91	
„ Cost of Jubilee Exhibition ...			210 68	
„ Cost to Society of Horticultural Exhibition			114 65	7,141 40
At Credit, Associates 1895, per Balance Sheet				5 00
Society's Funds				965 47
				$ 8,111 87
Paid for Maintenance of the Museum per separate Statement			5,642 64	
Amount at Credit per Balance Sheet			532 94	6,176 58
Paid Accounts for Horticultural Show				1,135 45
				$15,423 90

A letter from the Government Secretary was read, asking the Society to make a collection of colony woods for experiment at the Imperial Institute, for which the Combined Court had voted $750.

It was agreed that the Society should make the collection and that the matter be put in the hands of the Imperial Institute Committee.

The meeting then rose.

Meeting held May 9th.—Mr. R. G. Duncan, F.R., Vice-President, in the chair.

Members present 12.

Elections.—*Members:* Rev. C. H. Wright, Dr. E. Pinaud and Mr. T. J. Semple.

Associates: Messrs. W. H. Trowbridge, J. Vanier and G. Macintyre.

The following communication from the Agricultural Committee was read:—

Georgetown, May 8th, 1895.

Thomas Daly, Esq.,

Hon. Secty. R. A. and C. Society.

Sir,—In accordance with the Government Regulation, which allows the Agricultural Committee of the Society to obtain free analyses of articles of general importance to the agricultural interests, I beg to lay over three reports of the Government Chemist on Plantain Meal, Corn Flour, and Soils, which were examined at the request of the Committee.

In regard to the soils, the one on which the diseased plantains grew is very rich, and Prof. Harrison states that there is nothing in it to account for the disease,

I am, &c.,

S. R. COCHRAN,

Secretary, Agricultural Committee.

Analysis May 1st, 1895.

167. Corn Flour—

Moisture...	14·10
Fat	1·16
Ash	·14
Albuminoids	·88
Dextrin, &c.	·26
Fibre	·15
Starch	83·31
	100·00

A very excellent sample of corn starch, fully equal to any imported in the colony.

168. Plantain Meal—

Moisture	14·90
Fat	·40
Ash	·18
Albuminoids	·22
Gum-Dextrin, &c.	·19
Fibre	·15
Starch	83·96
	100·00

The sample is essentially one of a starch of excellent quality as regards purity, but slightly yellow in colour. I am of opinion that commercially this will only have value as a starch, and its outlook depends entirely upon whether or not it can be produced in sufficient quantity, per acre, to compete with potato starch and low grade arrow-root.

Analysis May 4th, 1895.

2 samples Soil, Pln. *Bounty Hall*, marked—

	Good Plantains.		Diseased Plantains.
Moisture	9·530	... ...	11·800
Organic Matters and Combined Water ...	10·300	... ...	11·730
Clay and Fine Sand...	65·910	... ...	58·620
Soluble Silica ...	·455	... ...	·508
Phosphoric Anhydride	·141	... ...	·084
Sulphuric Anhyoride	·064	... ...	·340
Alumina	9·329	... ...	12·392
Ferric Oxide ...	2·480	... ...	2·880
Ferrous Oxide ...	·320	... ...	·504
Calcium Oxide ...	·420	... ...	·765
Magnesium Oxide ...	·742	... ...	·392
Potassium Oxide ...	·417	... ...	·500
Sodium Oxide ...	·149	... ...	·218
Sodium Chloride ...	·058	... ...	·050
	100·315		100·783
Containing Nitrogen	·348	... ...	·510

Government Laboratory,
May 4th, 1895.

Sir,—I have the honour to forward to you the enclosed certificates relating to the samples submitted by the Chairman of the Agricultural Committee.

The samples submitted under the names of Plantain Meal and Corn Flour are samples of starches prepared from plantains and from maize. These of course differ in composition from the whole meals prepared from these substances, by their lesser contents of albuminoids, fat, sugars, digestible and indigestible fibres and mineral matters, and greater contents of starch. The soils are samples of soils from Pln. *Bounty Hall* upon which good plantains are producible or upon which only diseased plantains are obtainable. No chemical difference to account for this is apparent in the analysis, the soil which produces only diseased plants being the more fertile. It is in fact newly empoldered land evidently only affected by salt water. It is an excellent example of the remarkably fertile soil met with in certain districts of this colony,

Yours, &c.

J. B. HARRISON,
Government Analyst.

The Secretary, Agricultural Committee,
R. A. and C. Society.

The Chairman stated that the plantain meal, of which they expected so much was not considered by Prof. Harrison as of more value than potato starch.

Mr. Conrad thought that it was a very nutritious food and Mr. Vyle agreed with him. Mr. Binnie said there must have been something eliminated in the preparation, as the fresh plantain was undoubtedly rich.

The following Report from the Committee of Correspondence was read:—

The Museum, May 9th, 1895.

R. T. A. Daly, Esq.,
Hon. Secty. R. A. and C. Society.

Sir,—I have the honour to report that all that can at present be done to further the interests of the Horticultural and Poultry Show, which is to be held, by the kind permission of the Mayor and Town

Council, in the Promenade Gardens on the 29th August next, has been done by the Committee of Correspondence. Large posters and copies of the Prize List have been distributed broadcast over the colony; and appeals have beeu made to residents in all the various districts asking their assistance in securing the success of the undertaking.

Copies of the Prize List are still on hand in the Museum for distribution, and they can be obtained, on application, either from the Clerk or from myself.

I have, &c.,

J. J. QUELCH,
Hon. Secty. Committee of Correspondence.

Mr. Conrad was of opinion that the Agricultural Committee should have the management of the Horticultural Show.

The Chairman stated that the Committee of Correspondence took it over in accordance with the Bye-Laws, and Mr. Quelch said he thought that Committee would be very glad to hand it over next year.

The Honorary Treasurer laid over the annual list of members struck off for non-payment of their subscriptions, which was ordered to be posted in the Reading Room in accordance with the rules.

Mr. Jacob Conrad, on being requested to bring forward his motion for a Technical School, of which due notice had been given, withdrew it, on the ground that the members seemed to take little interest in the matter.

The Chairman thought at the present time there was a feeling that such a project could not be carried out—personally he was in favour of it, but he did not see how it could be made practicable just then.

The Assistant Secretary read a communication from the Government, covering a circular recommending the "Solanite" process for producing photographic copies, engineer's plans, &c., which was taken for notification.

The paper on Cane Cultivation at the Straits Settlements, read at the previous meeting, having been declared open to discussion :—

The Chairman said he thought the thanks of the planters were due to Mr. Campen for the trouble he had taken in writing the paper. It certainly contained a number of valuable ideas and suggestions, some of which he knew would be adopted to a certain extent. He wished that other planters might spare a little time and give them papers equally suggestive and valuable. He moved that a vote of thanks be accorded to Mr Campen, which being seconded by Mr. Gillespie, was carried nnanimously.

Mr. Quelch stated that a collection of photographs had been forwarded to the Exhibition at the Imperial Institute, in accordance with the recommendation of a former meeting, and informed them that the amount voted ($50), would probably be exceeded.

Mr. Quelch also exhibited two Indian guide-sticks, which by a series of indulations at different distances shewed what stages in a long journey were easy or difficult.

The meeting then terminated.

Meeting held June 13th.—Hon. E. C. Luard, President, in the chair.

Members present 14.

Elections.—*Members :* Messrs. S. G. T. Bourke, Hector Cameron Menzies and Samuel Barrett.

Associates : Charles H. Barclay, Arthur St. F. Dare and James Cannon.

Mr. Quelch reported that the photographs sent from

the colony to the Exhibition at the Imperial Institute had been installed through the kindness of Mr. J. L. Ohlson.

The following resolution from the Leeward Islands Agricultural Society was read :—

St. John's, Antigua, May 8th, 1895.

Dear Sir.—At a meeting of this Society held on May 3rd, it was unanimously resolved that a copy of the following resolution be forwarded to the leading Agricultural Association of each Colony throughout the British West Indies :

Resolved,—"That this meeting recognises with appreciation the effect created throughout the British West Indies by the circular addressed to them from this Presidency with regard to Sugar Bounties, and, in order to bring the matter before the Imperial Government, suggests the advisability of a Delegate from each Colony being sent home to England to lay the views of the Colonies upon this subject before the Imperial Parliament."

I beg therefore to direct your attention to this resolution and ask that you will give it your cordial support.

I am, &c.,

FRANCIS WATTS.

Hon. Secty.

The Secretary stated that nothing but the resolution had been received, and as far as he knew no action had been taken by the other colonies. He had noticed that Lord Kimberley had refused to receive a deputation on the matter.

The President said that in face of the refusal of Lord Kimberley he did not see that they could do anything, but it was for the members to make suggestions.

The Hon. Mr. Jones also said he thought nothing could be done. As for a countervailing duty by England it would be laughed at if proposed. Then, there were many people in England interested in the matter, who would bring it to the notice of the British Government if they saw the slightest chance of success. The cir-

cumstances were well-known and there was nothing that could be done that had not been done already. In face of Lord Kimberley's action he could not see the good of a deputation. The matter would no doubt be put right at some time or other, but meanwhile the sugar colonies might be utterly ruined.

It was finally agreed that no action could be taken, especially in view of the fact that they had no further information than the bare resolution, which was taken for notification.

Mr. Luke M. Hill read the following paper on Food Adulteration.*

The President said they had to thank Mr. Hill for his valuable and interesting paper, which he hoped would evoke some discussion at the next meeting.

He would like also to thank the Vice-President and others who had taken his place during his recent absence from the colony.

The meeting then terminated.

* This will be published in our next.

*Food Adulteration.**

By Luke M. Hill, C.E., Town Superintendent of Georgetown.

WHEN I was asked by our President to read a paper before the Society on some Agricultural or Commercial subject, I was in some difficulty to know exactly what to write about, because, as some of you, gentlemen, are aware, my connection with Agriculture and Commerce has not been so direct nor so intimate of late years, as it was during the earlier years of my residence in the colony.

However, eventually, after some consideration I decided to attempt a paper on Food Adulteration, which I thought might serve a threefold purpose,—being first, an appropriate subject for me to take up as an officer of the Municipal Government; secondly, the food substances to be dealt with being all agricultural products; and thirdly, the subject naturally presenting itself to one's mind as a phase of commercial morality; and thus as a whole Food Adulteration may be considered a matter of combined Municipal, Agricultural and Commercial interest.

I propose to confine myself strictly to Food Adulterations, pure and simple, and shall not, therefore, touch on the allied subject of Unsound Food, the sale of which may be looked upon as another phase of the commercial morality of Water Street; and which in the interests of the public health might well form the subject of another paper by some member of our Society more competent to deal with it than I am.

* Read at the June Meeting of the Society.

Adulteration may be considered as a product of overtrading, or at least as a result of undue competition in trade, rather than as a fraudulent, if not natural, consequence thereof. When prices are cut down to a figure at which it is impossible to produce a genuine article, one of two things must inevitably follow—a general "smash up" of the producer, or a sacrifice of quality by the admixture of some foreign substance of cheaper price to supply bulk and weight; and this practice is what is commonly termed adulteration.

In the earlier Food Adulteration Acts, practically no adulteration was recognised as such, unless it embraced additions or admixtures, dangerous, prejudicial or injurious to health. Now, however, we take a higher stand, and so the Acts presently in force, make it an offence to sell, *to the prejudice of the purchaser,* any article of food which is not of the nature, substance and quality demanded by such purchaser, no matter whether the admixture is injurious or otherwise, as for example an undue addition of water—*aqua pura* as it may be—to rum, brandy, whiskey or gin, beyond the exact degree of attenuation in this respect allowed by the Ordinance which in the case of rum is 20 degrees under proof, and 35 degrees for the other spirits named.

On the other hand, the Food Adulteration Ordinance permits the admixture and compounding of other materials with a genuine or original food substance, provided such admixture is not injurious to health, and not intended fraudulently to increase its bulk, weight or measure, or to conceal its inferior quality; and provided, also, that the purchaser is made aware of the mixed or compounded nature of the sub-

stance he is buying, so that he is not prejudiced thereby.

For instance, following up the spiritual example, I believe there is nothing in the Ordinance to prevent a dealer from selling unduly watered whiskey, provided he sells it as "whiskey and water," and acquaints the purchaser of that fact.

It not unfrequently happens that a vendor may innocently offer for sale an adulterated article of food without knowledge of the fact, the adulteration having been made before it reached his hands, or possibly before its arrival within the colony. But in such a case the law protects him from penalty if he can prove the following facts—

(a.) That he purchased the article in question as the same in nature, substance and quality as that demanded of him by the purchaser, and with a written warranty to that effect.

(b.) That he had no reason to believe at the time when he sold it, that the article was otherwise than as demanded by the purchaser.

(c.) That he sold the article in the same state as that in which he purchased it.

A beneficial effect of the present Adulteration Ordinance is to legalise the manufacture and sale of Margarine, which formerly was looked upon with suspicion as a well-known adulterant of butter, or as a fraudulent substitute therefor.

Although it is still a punishable offence to use it in either of these ways, it now stands on its own reputation as a recognised article of commerce, and as a wholesome article of food, equal to butter in many respects, and having its advantage in cheapness.

Last year's importation of Margarine into the port of Georgetown amounted to 211,516 lbs. valued at $24,031 18.

Until within recent years the manufacture of Margarine was confined to the United States and the Continent, but latterly manufactories have been established in England, within reach of the great central meat markets of the country.

Its composition consists of 20 per cent. of Vegetable (Nut) Oil, 20 per cent. of new milk, and 60 per cent. of the best Beef Fat, known as Oleomargarine, being the beef suet after the insoluble stearine or coarse fat has been pressed out of it. These ingredients, after being mixed and churned together for some time, are discharged into tanks of iced water, from the surface of which the solidified Margarine compound is collected, washed and compressed into a marketable commodity.

The Margarine mass solidifies in the form of minute crystals of Margaric and kindred acids, and not in oil globules as in the case of butter.

This fact affords a test under microscopic examination, for its presence as an adulterant of genuine butter.

As you are aware, during the past 12 months considerable activity has been displayed in enforcing the provisions of the Food and Drugs Ordinance No. 14 of 1892; and the Government Chemist has supplied the Central Board of Health with quarterly lists, summarising the results of the analyses made of the several articles of food sent in to him as the only Public Analyst appointed under the Ordinance in this Colony.

In these lists, as published from time to time in the newspapers, the proportion of adulterated samples appears very high; but this I consider should not be

taken as evidence of the general character of the food supply of the colony, for naturally few but *suspected* samples are taken to the Public Analyst for examination, and, therefore, the proportion of adulterated to non-adulterated samples would necessarily be large.

There is no doubt but that the prosecutions following on these examinations have had a beneficial effect on the foreign food supply of the colony, as importers are more careful to see that their goods are of the nature and quality demanded.

For the majority of the samples brought before the Public Analyst for examination, we are indebted to the energy of the Police Department, acting under special instructions from Professor HARRISON, the Government Chemist, who may be termed the High Priest of the Adulteration Ordinance, and who takes a keen interest in the working out of its beneficent intentions, without involving anything approaching the nature of vexatious prosecutions in cases where the sample, although strictly speaking adulterated, is so very slightly so, that it may reasonably be considered on the "border land" when a warning alone should serve as a sufficient deterrent.

By far the largest number of samples examined by the Public Analyst were those of Milk, Butter and Lard: the first named being the only one of purely local production.

MILK.

A large proportion of the milk sold in Georgetown is brought in from the country districts by Coolies, who are the chief offenders in the way of milk watering, which is about the only form of milk adulteration practised locally; but we have reason to know that the

mixing is not always confined to pure rain water, as the roadside trenches frequently contribute the necessary element of adulteration, and the water in these is not always as clean, nor as pure, as could be desired.

A few years ago, within my own experience, a small fish was found in the morning's milk: this, to any ordinary mind, would appear to be *prima facie* evidence of the watering can, but not so to that of the 'Mild Hindoo', who explained the presence of the fish by a novel theory of his own, namely, that the cow must have sucked it up when drinking water from the trench, and so it found its way into the Milk Pail!

A curious fact ascertained by the Public Analyst is that milk adulteration is more prevalent on Sundays than on week days—"the better day the better deed," apparently!—due, probably, to increased demands that day amongst the poorer people, who are the principal customers of the Coolie Milksellers.

It is satisfactory, to know, however, that the general household supply of milk from private dairies in and about Georgetown, is usually of excellent quality; although cases have been known where, in its delivery, the messenger gains a bottleful for his or her own benefit by a judicious thinning down and blending of the contents of the others, as he travels round with his basket or cart from door to door.

Every institution and household should be possessed of a simple glass lactometer, costing but a couple of shillings, with which, for all practical purposes, a very good general idea of the quality of the milk supply may be ascertained, if the testing is done when the milk is fresh. A more complete examination embraces not alone

the chemical composition of the milk, but also its physical characteristics, such as colour, obscuration and freedom from deposit.

The standard for new milk recognised by the Gloucestershire Chamber of Agriculture, and I believe by the general body of Public Analysts of Great Britain, is 11·5 per cent. of solids, of which not less than 3 per cent. must be fat. This is higher than what is known as the Somerset House Standard, but which is generally admitted to be too low for ordinary English dairy milk of average quality, though it is found a convenient test for passing the more attenuated new milk imported from the Continent, and to which preservative agents have had to be added, thus lowering its standard.

The quality of our local milk, when unadulterated, is found to be much richer in butter fat than the English standard, but this is attained at the expense of quantity, the average yield from cows in this colony being a long way under that of home dairy farms.

It is a well acknowledged fact that the quality of milk depends very much on the breed of cattle, their condition, and the nature of the feeding, indeed, I believe it is admitted that a cow might be so fed as to yield milk of such poor quality, that an Analyst would be warranted in reporting it to have been adulterated, although no water had actually been added.

Most of us remember the advertisement from a respected estate's Manager, not 100 miles from Georgetown, which appeared in the papers some time ago, announcing that *until rain fell*, the supply of milk from his dairy in town would be limited, thereby suggesting an implication that was by no means intended!

Skimmed milk is not an unfrequent mode of adulterating fresh milk, that is to say that the cream is removed either by skimming or by the more modern form of separation by centrifugal machines known as milk separators. This has the effect of lessening the amount of fat in the milk by about 2 per cent., as also the total solids, and so increasing the percentage of water; or in effect lowering the specific gravity of the milk. Temperature has, however, also the effect of doing this, the average specific gravity of new milk ranging from 1,030, at 60° to 1,026 at 84° F.

Although milk is reduced in money value by the removal of its butter fat, skimmed milk has still considerable value as an article of food, its albuminates and carbo-hydrate constituents remaining practically the same: indeed to some stomachs it is more digestible than fresh milk, and as it is sold cheap, it is a boon to poor people.

In the country districts of Ireland, where the small farmers dispose of their new milk to the Central Butter Factories, or Creameries, the separated milk is usually returned to them for calf and pig feeding, but it is found advisable in using it for this purpose, to restore the fat constituents removed by the separators, or at least to substitute others, and this is done by the addition of oil cake, or linseed meal.

A most convenient form in which milk is now preserved for an indefinite period is that known as Condensed Milk, put up in hermetically sealed tins. It is usually made of skimmed, or separated milk, to which sugar is added and then evaporated to a pasty consistency, like very thick cream. It is afterwards

thinned down by the addition of water when required for use.

Condensed Milk is invaluable on shipboard, during long voyages, or wherever we may be away from the natural cow; and is extensively used in the Gold bush of Guiana.

Last year's importation of this article of food alone, amounted to 218,747 lbs. valued at $20,559.97.

BUTTER.

Almost all the Butter used in the colony is imported, which is a matter of regret, seeing that the enterprising proprietor of the Nonpareil Dairy has demonstrated the fact that excellent fresh butter can be made within the colony. His present sales in Georgetown are some 7,000 lbs. per annum, but I have his assurance that, were the demand better, he has butter-making appliances and sufficient milk supply at command to enable him to turn out nearly twenty times that quantity if required.

The quantity of butter imported into the colony during the last financial year amounted to 647, 361 lbs., valued at $124,715 60. This may be roughly divided into two classes—table butter and cooking butter; the first being more or less "mild cured," of Danish, Swiss or Dutch origin, preserved in hermetically sealed tins; and the other salted butter, put up in barrels or firkins, the greater part coming from Morlaix, France, being the product of the fair fields of Normandy and Brittany.

Most of the tinned butters, especially those of Danish manufacture, are found to be high-class unadulterated samples, or at least containing well above the percentage of butter fat required by the local standard, which is only 75 o/o, being the same as that recognised

in the neighbouring West Indian Colonies of Trinidad and Barbados, as against 80 to 85 o/o in England.

Except in regard to heavy salting and a rather high percentage of water, the French butters are as a rule pure and free from admixtures of foreign fats, oleomargarine, &c.

The French authorities appear to be very strict in enforcing purity in this respect, so as to sustain the character of their national butter; and any detected adulterations are very heavily punished by both fine and imprisonment.

There is no question but that butter put up in ordinary packages for shipment to tropical climates requires to be much more heavily salted to ensure its preservation, than even ordinary salt butter for the English Market, probably to the extent of *at least* 5 per cent more: indeed I am informed that Morlaix butter is salted in course of manufacture for foreign shipment to the tropics, by the addition of 12 per cent of salt to weight of butter. This, no doubt, also accounts for a high percentage of water in the butter, for it is a recognised fact that high temperatures affect the relative proportions of water and salt contained therein; and for this reason the total percentages of the two are usually taken together.

It has been suggested, with some degree of reason too, that there should be two recognised legal standards in butter analyses—one for fresh or mild cured, and one for salt butters; indeed there should be no difficulty in attaining a standard of 85 to 95 per cent of fats in mild cured and fresh table butter, after making allowance for a fair proportion of salt and water; and it is therefore evidently unfair that both classes of butter should be judged by the same standard.

In the manufacture of Irish salt butter, I may mention that about 6 per cent of brine—that is salt and water—is directly incorporated with it in addition to the ordinary dry salting, which certainly adds to the percentage of water; but this class of butter, which is sometimes known under the name of Irish *pickled* butter, has the reputation of keeping better and longer than the ordinary dry salted butters of England and the Continent.

When I was in Ireland last year a "battle royal" was being fought between the Irish butter makers and merchants on the one hand, and the adulteration authorities on the other, on this question of salt and water; and by a curious coincidence it so happened that something of the same sort was going on here about the same time, in regard to imported salt butters.

The whole subject is now under consideration of a Select Committee of the House of Commons; and the result no doubt will be the recognition of two legal standards for the two classes of butter, as has been suggested.

GHEE.

Ghee, known as Coolie butter, is the produce of the cow or buffalo; and in fact is ordinary butter clarified by melting over a slow fire and removing from the melted mass all the water and the heavier and coarser constituents of the butter.

It is said to keep much longer than ordinary butter: indeed, I understand, that the older it is, the more valuable it is considered for use in sacrificial and other religious services by the Hindoos; and some extra rare and valued samples are known to be more than 100 years old.

The imports of Ghee last year were 138,687 lbs. valued at $16,211 90; but I believe a large quantity is made in the country districts of the Colony by the Coolies themselves from ordinary butter.

When used in religious ceremonies, it is of course, considered essential that the Ghee should be pure and free from adulteration of any sort.

A large proportion of the imported article is found to be adulterated with foreign fats, Margarine compounds, Cocoanut and other vegetable oils.

Having taken up so much time and space with the food products of the cow only, I fear I have already well nigh exhausted your patience, and must, therefore, after a brief reference to Lard adulteration, allow my paper to remain, more or less, a dissertation on Milk and Butter rather than on Food Adulteration generally.

LARD.

The imports of Lard during the last financial year reached 386,242 lbs. valued at $29,525.37.

Most of this, I am afraid, must be set down as an adulterated or compounded article, as by the published lists from the Public Analyst it would appear that he rarely if ever receives for examination a sample of genuine lard.

Most of the imports come from the United States, where I understand ingenious contrivances are brought into play during the preparation of lard for the Colonial Markets, whereby a very large percentage of water is injected into the substance of the material, and fraudulently increasing its bulk and weight.

This excess of water alone, or together with admixtures of Cotton seed and other vegetable oils, constitute, I under-

stand, the chief adulterants of lard as sold in our local market.

Leaving untouched numerous other food substances, such as Flour, Meal, Bread, Starches, Sugar, Tea, Coffee, Chocolate, Condiments, &c., I must now bring my paper to a close, trusting that I may have succeeded in directing some attention to, and arousing interest in, the important subject of Food Adulteration.

In conclusion I have to acknowledge my indebtedness to the Comptrollor of Customs for the figures quoted of last year's imports; and to Professor HARRISON for a summarised list of the Analyses made by him under the Food Adulteration Ordinance, which I append to this paper. I may add that, following on these examinations, 95 convictions were obtained at Magistrates' Courts, and fines amounting to $1,355 imposed.

APPENDIX.

List of Food Samples examined by the Public Analyst at the Government Laboratory, Georgetown, Demerara, for year 1894–95.

	No. of Samples Examined.	No. Found Adulterated.	Percentages of Adulterations.
Milk	102	43	42.1
Butter	71	52	73.2
Ghee	41	28	68.3
Lard	36	33	91.6
Margarine ...	7	1	14.3
Olive Oil ...	3	3	100.0
Mustard Oil ...	2	2	100.0
Rum	22	3	13.6
Gin	16	2	12.5
Whiskey	5	1	20.0
Brandy	3	...	...
Total ...	308	168	54.5

Stray Notes from Pirara.

By C. A. Lloyd.

THE Pirara River, or as it is known to the Spaniards, "Rupununi Chiquito," is said to derive its name from a small red speckled fish which abounds in its waters. It takes its rise somewhere in, or near, the Kanaku mountains, and after coursing through the Savannah for some miles, at length discharges itself into the Ireng, one of the large rivers of the Amazon system. It is by no means an imposing stream, but winds like a corkscrew through a most dreary stretch of Savannah, in some places being only a few feet wide, appearing more like an artificial canal than a work of nature. The country through which it runs, despite its lack of scenery, is rendered almost classic ground through Sir WALTER RALEIGH, who imagined the fabled city of El Dorado to have been situated here, but unless the configuration of the country has greatly changed since Sir WALTER'S time, a more unfit site for a grand city, such as El Dorado was said to have been, could not be selected. Here, in the dry season from February to April, the heat and glare of the sun is intense, while during the rainy months from May to August the whole country is one extensive sheet of water, where sandflies, mosquitos and a host of other insect pests render life almost unbearable. The village of Taranamouta or Taranambo (also known as "Gallina Matta") so-called, the Macousis say, from an extinct tribe of gigantic men who long ago inhabited the district, is situated about 10 miles south-east of

Quattata, a once flourishing settlement, but now completely deserted. At Taranambo the German traveller, CARL APPUN, had his head-quarters, but all that was left to mark the site of his camp at the time of our visit was a large plant of the handsome Lily, *Crinum giganteum*, which we took away with us on our return to Georgetown. Here, too, a later traveller once fixed his station and engaged for himself a wife, whom he purchased for sundry articles of barter. The fair damsel, however, for some reason only known to herself, changed her mind after the bargain had been closed and would have nothing to do with him, on which he immediately demanded from her parents the cloth &c., he had given them for their daughter, but they having in the meantime disposed of most of the things were unable to comply with his request. This led to disagreeable consequences, and the traveller's departure from the village was a matter of great satisfaction to the Indians.

At Taranambo we lived for some months, making excursions to Pirara, visiting the different Indian Settlements and prying into their huts for curios. The interior of these huts is always very dark, especially if they have only one door—as is often the case—so that on entering one has to wait some time until the eye grows accustomed to the darkness before an inventory of his surroundings can be taken. The sides of the clay walls are usually hung with gourds for holding water &c. They are of all shapes and sizes, some flat and circular like Gruyere cheeses, others shaped like a retort with its curving "goose neck," while some again are perfectly round, resembling large cannon balls. On the ground at either side of the centre-pole two huge Piwarrie troughs with

their ends rudely fashioned in imitation of turtles' heads, are always to be seen. Suspended perpendicularly from the roofs by strings hang blow-pipes of different lengths with their quivers of small darts. Sticking in the thatch overhead are long arrows of various make—from the spear-like subrarie for killing the thick skinned Tapir, to the trident heads used in shooting small fish, and the knobbed points for stunning wild birds. Others there are with broad Bamboo points daubed with the deadly Wòurali, while small Calabashes containing the black tar-like poison and covered with the rough leaves of the sandpaper tree, *Curatella Americana*, to keep out the damp which affects its virtue, stand close at hand. Bows, elegantly made from the tough Letter-wood and Wamara, lie idly unstrung till required, basket-work in various stages of manufacture, balls of spun cotton for Hammock making, a few "Tikies," (clubs) and pretty feather crowns, enliven somewhat the smoky, dingy place, which is rendered frowsy by the many Anatto-dyed hammocks of the household slung from one upright to another. Usually, in the darkest corner of the establishment is placed the hearth. It consists simply of a slab of iron or stone raised a few inches from the ground on props. Here the lady of the house bakes her cassava bread. Close by in another corner hangs that most ingenious squeezing apparatus the Matapee, with which she has expressed the poisonous juices of the cassava tuber, the mealy portions of which pressed into a cylindrical shape may be seen piled in a heap on a mat on one side ready for use, while on the ground a large gourd filled with the sour expressed juice ferments and attracts swarms of tiny flies. Filthy, dirty

looking calabashes lie strewn on the floor, with lean, mangy dogs, licking and smelling at them; these are the drinking vessels in every day use and which seem never to be washed. Altogether the interior of an Indian's dwelling is not calculated to make a favourable impression on the traveller.

A little to the east of Taranambo the Awaricuru glides on its way to mingle its waters with the Rupununi, near its junction with which it forms a lake-like expanse, dotted with islands and abounding in fish. The Arawana, *(Osteoglossum bicirrhosum)* a curious large scaled fish, is the most common, and is annually slaughtered for food by the Indians in great numbers. The large Arapima or Warapi, *(Arapima gigas)* though also plentiful, is seldom or never eaten by the Macoushis, but the Wapisianas we were told are very partial to its flesh. The Arapima is a singularly shaped and pretty fish. On the upper parts it is of a dull olive brown, shading off into silver on the sides, operculum (gill covers) and belly, where some of the scales have red edges forming a pleasing combination of colours. The tail, which is about two or three inches in length, is almost circular, and very small when compared with the size of the body, which attains to the length of from seven to eight feet. It is stated to grow to double that size, but we were never fortunate enough to fall in with any such monsters. The male fish can be distinguished at a glance from the female—the red-edged scales being fewer and not so bright in colour.

On the banks of the Awaricru the "Negro Cop" *(Mycteria Americana)* breeds regularly. The nest, which is a rather bulky affair, consists of a bundle of sticks, these varying from half to one inch in circumference. It

much resembles a gigantic pigeon's nest and has but a very slight depression in the centre for the reception of the eggs. These nests are generally placed on the large limbs of the silk-cotton tree *(Eriodendron anfractuosum)* parallel to the limb, and to avoid being blown down by the wind are cemented by a thick layer of mud mixed with grass, which on drying becomes hard and thus thoroughly secures the structure. The eggs, which are about the size of those of a goose and of a dirty white colour, are laid in September, the usual number being four, but occasionally five are deposited. The young birds make their appearance about the end of October and are then the size of young ducks, and covered with a grayish-white down. They are unable at first either to stand or squat up, but lie in the nest stretched at full length, with their heads on one side as if lifeless. The beak at this stage is perfectly straight, showing not the slightest indication of the upward curve at the tip characteristic of the adult bird. When the nesting tree is approached the mother bird stands upright in the nest as a signal to her mate, which is never far off. He hastens at once to her side, and strutting up and down, claps his mandibles together with a loud defiant click that can be heard some distance away. The young birds grow rapidly, and in a few weeks are nearly the size of their parents, but their bodies are still too heavy to be supported by their long weak legs, and not until the first plumage is complete are they able to stand upright in the nest. The quantity of fish the young birds consume is astonishing, and all day long the parents are constantly employed supplying them with food. For some time after leaving the nest

the birds are of a light drab colour, and they only assume the snow-white plumage of the adult after several moults. The Hunuri *(Ardea cocoi)* also builds on the Awaricuru, and we once took a nest in the month of June; it was a flat shallow structure, placed in a tall tree, and contained one light blue egg a trifle larger than that of a fowl, but not so pointed. As it proved to be fresh on extracting its contents, it is probable that the bird lays no more than one egg at a time. Almost due west from Taranambo is a village known as "Manarrie Macree," but it also rejoices in the name of "Tamanoir Ecuru" which literally means "tame Ant-eater"—why we were never able to ascertain. At this village resided a Brazilian Ranchman who was exceedingly kind to us during our stay there; he was the happy possessor of a very pretty young wife, who like himself was of Indian extraction. Besides his wife he owned a goodly herd of cattle, and of the excellent milk they produced we were allowed to partake *ad libitum*. While staying here we learnt the following bit of Indian legendary lore:—

Long ago, there was a time when the Macoushis had no cultivated food plants, and depended entirely upon the meagre produce of the forest for their vegetables. Suddenly, one day, there appeared amongst them two fair complexioned men, brothers, the elder named "INCHKERAN." Seeing the poverty-stricken condition of the people, they decided on travelling to find some means of alleviating their sufferings. After wandering about for many days in the forest they came across a tree laden with fruit of all kinds. This they cut down, although it was so large that it took them several days to perform the task. Succeeding at length, the tree fell, and in

falling scattered its seeds far and wide over the country, from them springing the plants they now cultivate. After this the brothers continued their journey, until they arrived at Corona on the Ireng, where for some reason not very clear they began to dig a large hole in the ground. On doing this, the younger brother was transformed into a labba, and "INCHKERAN" was forced to continue his travels alone. Before leaving the spot however he fecundated the stones, which then changed into people, whom he commanded to search for his brother until his return. "INCHKERAN" then set out in the direction of Roraima, from whence the Macoushis expect him to return at any moment, bringing with him the good things of the world. They say that Plantains, Corn, Cassava, &c., can still be found growing wild in some parts of the Savannah, and that the hole dug by "INCHKERAN" and his brother is to be seen to this day at "Corona."

Another little legend is that the Pleiades, which they call "Tamongkong," were children, who being badly treated by their mother went to live in the skies, where she could see but not reach them.

We left "Manarrie Macree" one fine morning, and turning our faces towards Brazil, camped in the afternoon on the Nappi Creek. At this place we saw for the first time the Ginep *(Melicocca bijuga)* growing wild. Our men, who called it *"Macou,"* soon felled a large tree to get at the fruit, which were much larger and sweeter than those sold in Georgetown. Here too the *Victoria regia* grew to a size far surpassing any we had yet seen, and the delicate perfume distilled by the large flowers was wafted by every passing zephyr to our camp.

In the morning one of the men on getting up disturbed a small brown dove, that had its nest in the tree to which his hammock was tied. Snatching up a gun he started in pursuit, and in a few minutes returned to us with the poor bird blown almost to pieces. Thinking that the nest might contain young birds, and not wishing to leave them to die of hunger, we had it taken down, when to our surprise it contained two pretty light yellow eggs which were undoubtedly those of a dove of some sort, but differed from all *Columbine* eggs we have seen in that they were not white. Neither was the yellow colour due to the forming of an embryo, for they proved to be very slightly incubated.

We arrived on the Brazilian side of the "Takutu" River the day after leaving "Nappi" and were most kindly received and treated by DON PEDRO, a Venezuelan, with whom we stayed at his Ranch "San Lorenzo." This worthy frontiersman resides with his wife in an Adobe house, and seems quite happy and contented, though he was loud in his complaints against the jaguars which played sad havock amongst his cattle. Several handsome skins adorning the walls of his cabin proved, however, that they were not always successful in their raids on the DON'S fat herds. Señora DON PEDRO was a great hand at hammock making, and some that she showed us were masterpieces of workmanship; the prices charged for them were however very high. We spent three happy days at "San Lorenzo" with our Venezuelan friend, whom we left on the fourth morning bewailing the loss of a favourite hunting dog, which he said had been poisoned from eating the bones of a savannah powise *(Mitua tomentosa.)* Not only the DON, but

the Indians also asserted that the bones of this bird are highly poisonous to dogs at certain seasons and that they commonly lose their canine friends through this cause. No stay was made on our return to "Manarrie Macre," but obtaining a few bottles of milk from the Vacquero, we started at once for "Taranambo" by a different route from the one we had come.

That night, while camping near the mountains, we were suddenly startled from our slumbers by a loud report, which we can only liken to the dischage of a heavy piece of ordnance. The Indians could throw no light on the subject, but said that whenever they heard it they knew that the water was about to swell in the rivers. Of the cause of this curious phenomenon we are profoundly ignorant, but we feel that the impression it made upon us, occurring as it did at the dead of night, in a most gloomy and wild part of the country, will never be forgotten. Striking camp rather late in the morning, we covered but a few miles before halting for breakfast at a deserted hut, near which meandered a fine clear brook, where we found several specimens of a singular fresh water *Hemiptera* belonging to or near the Genus *Ranatra.* Their bodies were flat and narrow, ending in a long respiratory process, the first pair of feet being raptorial like those of the Mantis, but set horizontally. Our breakfast consisted of a piece of "Salt Horse" which had been brought from Brazil; it was of the colour and texture of a chip of Mora wood, and for all we knew had voyaged round Cape Horn a dozen times. Although so salt as to take the skin off our tongues we managed to force down a piece with some hard cassava bread. We afterwards had occasion to regret

our temerity in partaking of the stuff, for being told by the Indians that water was plentiful in the district we neglected to take a supply with us, as was our usual custom, and the horrors of that afternoon are indelibly stamped on our memories. For hours we walked through the broiling sun, trying to allay our thirst by keeping iron-stone pebbles in our mouths, but no water could we see. How we blessed those Indians! the oaths we uttered were real studies in Anglo-Saxon. At last we came to a hole containing a small quantity of water, which although thick with confervæ and covered with a thin iridescent crust of some mineral substance, we swallowed greedily. This evening we came to a small settlement of about four houses and camped for the night. Close to this place is a creek in which the man informed us that a plenty of gold is to be found, in fact he shewed us a piece of quartz in which small nuggets of gold could be distinctly seen. From the appearance of the country it seemed a most likely place, but we were unable to test it from want of time and the necessary tools. On the right bank of the Rupununi, the Indians informed us that gold had been worked in years gone by and that the old mine can yet be seen. The Chief of this little place had two concubines although a parson who visited the savannah sometime ago had married him according to the rites of the Anglican Church.* This gentleman of Orders Holy appears to have done more harm than good, for in two weeks he married and christened over two hundred Indians, the former rite being performed by the free

* We do not refer to the present Minister at Waraputa, the Revd. Dorsett.

use of his own ring. The result was that the poor people, never having received any spiritual instruction, thought themselves exempted from all labour, and as the parson had blessed them, they neglected their provision fields and were on the verge of starvation. On this part of the Savannah there are extensive forests of maran, ballatta and letter-wood trees, and the Brazilian squatters carry on a considerable trade with the last named wood, which seems to be highly valued in Brazil, as much as ten dollars being given for a walking stick. If some restriction is not put to this wholesale destruction we fear that in a few years letter-wood will be very scarce in this part of Guiana.

One day, while passing through a strip of timber country, we came upon an old shed which we were told had been erected by a piaiman, who used to retire here to boil his Wourali. When the poison is being manufactured no one is allowed to go near the hut, and the piaiman abstains from all food for several days. It is believed that the longer he fasts the more virulent will be the poison. While on this subject it may be well to notice some Indian superstitions with regard to hunting. When a man is first inoculated for hunting he does not taste of the flesh of the animals he shoots for some weeks, but simply contents himself with lying in his hammock watching his friends devour the results of his labour; it follows therefore that by the time the etiquette of his tribe permits him to join in their feasts he is reduced almost to a skeleton. It appears that the hunter believes the beena, or charm with which he is inoculated, destroys his scent and allows him to stalk an animal without its being aware of his approach, and that the partaking of its flesh before a certain period

destroys the charm and necessitates a second doctoring. Again, on going to shoot ducks in the evening they never call their names but speak of them as "the things that see far."

Soon after leaving the old hut we fell in with a young Indian and his wife, the latter carrrying a "quake" containing a beautiful male Cock-of-the-Rock, *(Rupicola crocea)* in splendid plumage, which we offered to purchase, but which she refused to sell. She told us, however, that we could secure the birds in great numbers hard by, and that this month (March) was their nesting season. We decided on camping at a settlement not far off to try and procure specimens, with their nests and eggs. Accordingly, on reaching the village we halted for the balance of the afternoon, and in company with one of our men, started off at once in search of their building place, which we soon found and succeeded in taking a couple of nests. They each contained two speckled eggs, little larger than those of a pigeon. The nests are placed on the bare rocks, and constructed of palm fibres stuck together by a kind of gum. These were the only two nests that we found with eggs, although we saw many deserted ones. The birds feed on the fruit of a palm, which seems to be a species of *Œnocarpus*, and judging from their harsh cries around us they must have been very plentiful, but we never caught sight of one. The Macoushis call the bird *Kavanaru*.

On returning home we were surprised at the number of inhabitants contained in the little settlement. There were only three houses, but these sheltered twenty-nine people, of whom very few were women.

The men all wore nose ornaments made of Spanish silver. The little loop through which the pin passes to fasten the ornament to the septum of the nose is invariably made from the quills of the marudi *(Penelope sp.)* and powie feathers. The same feathers are also used for balancing the end of the arrow, and we understand that no other quills are used for these purposes among the Macoushis. Rising early next morning we resumed our journey, and stopped for breakfast at the site of what was once the Revd. YOUD'S Mission Station. Our readers will remember that Mr. YOUD was the English parson who, about 55 years ago, was forced by the Brazilians to fly for his life. Mr. YOUD died at sea on his way to England, from poisoning, and the Indians assert that the man (a Macoushi) who poisoned him was subsequently struck dead by lightning while in the church one Sunday imitating a parson preaching. Our breakfast consisted of Biara fish *(Hydrolycon sp.)* dried over the smoke on the "Barbecue," with the inevitable cassava bread, but though so common a fare we greatly enjoyed it. The flesh of a fat Biara dried in this manner is delicious and almost compensates for the hardships one encounters while knocking about the great Savannah.

Breakfast over, we continued our tramp, our men having previously set fire to the dried grass. It was a singular and interesting sight to see the flames sweep like the wind over the country. The effect that these constant conflagrations have is truly remarkable. The springing of the grass appears to depend upon them and species of *Pæpalanthus* never put forth their feathery white flowers unless scorched by the fire; even a caterpillar has learnt to gallop for its life.

*The Relation of Boiling Temperatures in Multiple Evaporation.**

By F. I. Scard.

ONE of the most interesting appliances in connection with modern sugar making is undoubtedly the "Multiple Effect." Although of comparatively recent connection with this colony, this great fuel economiser was incepted by PECQUEUR as far back as 1830, and has since been the object of attention and investigation by the principal Continental specialists, who until quite lately, really furnished all the written information obtainable on the subject, the name of RILLIEUX being specially associated with the practical application of PECQUEUR'S idea. But, even after over half a century of scientific attention, there are still questions in connection with Multiple Evaporation remaining unsolved, not the least being that which forms the subject of these remarks.

Primarily, a Multiple Effect is nothing more than a series of closed vessels, divided by the walls of the heating surfaces, into chambers for the boiling juice and heating vapour respectively, a vacuum pump reducing directly the boiling temperature of the last vessel, and, indirectly, of each of those before it. The vapour produced in the first vessel travels to the second, which also receives the juice from the first, and does further evaporation by virtue of the lowering of boiling point from the influence of the vacuum in the last. From the

* Read at the September Meeting of the Society.

second the juice and vapour pass to the third and so on, until the former, concentrated to the proper density, is withdrawn from the last vessel, the vapour therefrom passing to the vacuum pump after condensation by the injection associated with the latter. The contents of the vessels, therefore, have progressively lowered boiling temperatures, and it is some points in connection with the relation existing between these that I propose to put before you in this communication.

Under the conditions mentioned it would be natural to suppose that the total range of temperatures between the first and last vessels would be evenly divided among the series. Thus, if n=the number of vessels, t_1, t_2, t_3—t_n their respective boiling temperatures, the difference between any two of the latter might be presumed to be $\frac{t_1 - t_2}{n}$. That this is not the case has been generally overlooked by writers on the subject, or if recognised, attributed to special causes, such as defects in construction, scaling of heating surfaces etc.

Thus, even as recently as 1890, HUTSON ("The Engineer," June 6th, 1890), bases his calculations on practically even divisions of temperature, as he takes the distribution in the case of a Triple Effect to be

	1st Vessel.	2nd Vessel.	3rd Vessel.
	208 deg F.	175 deg. F.	140 deg F.
Diff.	33 deg.	35 deg.	

In a recent work, published last year, HORSIN-DEON, the great French authority on Evaporation, for the first time mentions that the increase of difference of temperature noticeable in the progression of vessels is *not* due to faulty conditions of work, but is the natural

state of a good working apparatus. In other words, that the condition is physiological and not pathological. His explanation is that from expansion of the vapour following the reduction of atmospheric pressure, in its progress through the series, there is less condensation per unit of heating surface and of time, and that the banking up of the temperature is a necessary consequence—necessary to enable the heating surface to accomplish its work of transmission.

Another hypothesis, while regarding the rise of temperature as essential for adequate condensation, attributes its necessity to the increased number of units of heat requiring to be dealt with, arising from the vapour evolved from the volume of liquor passing forward to a condition of lowered boiling point. Thus, if $A_1, A_2, A_3 \ldots A_{n-1}$ represent the number of heat units in vapour from vessels 1, 2, 3...n—1 respectively, and $B_1, B_2, B_3 \ldots B_{n-1}$ the units of heat given off from the volume of juice itself as it goes forward resulting from the difference in the boiling temperatures of 1 and 2, 2 and 3, n—1 and n respectively, the units of heat to be dealt with in vessel 2 would be $A_1 + B_1$, in 3, $A_2 + B_2$, or $A_1 + B_1 + B_2$, in 4, $A_3 + B_3$ or $A_1 + B_1 + B_2 + B_3$ and in vessel n, $A_1 + B_1 + B_2 + \ldots + B_{n-1}$. To deal therefore with this, the efficiency of the heating surface would have to be increased by augmenting the difference in temperature mentioned above.

In the "Sugar Cane" for February 1893, N. LUBBOCK alludes to these differences in the distribution of temperatures, attributing them to, firstly, the increase in the latent heat of water as the boiling point falls, and, secondly, the less receptivity to heat of liquids at lower

temperatures, the effect of the latter being to retard condensation. While the former of these is an important factor in the case, leading, however, *per se*, to directly opposite results as to temperature than those observed, I may at once point out that the latter has no bearing on the question, the Table in Box on "Heat" from which it is derived evidently referring to the rate of transmission of heat by liquids at different temperatures, but under the same atmospheric pressure, and merely meaning that this rate increases with the internal molecular motion. As the contents of all the vessels of a multiple effect are at their respective boiling points, and therefore at the same molecular tension, the figures in question can have no application in the present instance.

As a further explanation, lessened conductivity from increasing density, and consequently greater viscosity of the juice, has been adduced.

The above form the principal hypotheses in connection with the subject, and it will be particularly noticed that all, with the exception of that of N. LUBBOCK, are based on the need for more transmission of heat power as the series progresses.

Before going further into the subject it will be as well to put forward definite experimental figures as to what these temperature differences really amount to, and the following, derived from careful observation on three Triple Effects under my notice, will supply the necessary information. In these, the temperatures represent the boiling points corresponding to the vacua, which were recorded by gauges carefully tested and corrected. The records were made at regular intervals during the day, and extended over some weeks.

Observations were also conducted on two Yaryans, but, from the many complex conditions associated with these, it was thought advisable, for the purposes of this communication, to adhere only to the figures obtained with the simpler Triple Effect.

Omitting the detailed figures, the mean results obtained were :—

		Temp. Fahr.	
Triple A	1st Vessel.	2nd Vessel.	3rd Vessel.
	203 deg.	176 deg.	132 deg.
Diff.	27 deg.		44 deg.
		Temp. Fahr.	
„ B	1st. Vessel.	2nd Vessel.	3rd Vessel.
	203 deg.	180 deg.	136 deg.
	23 deg.		44 deg.
		Temp. Fahr.	
„ C	1st. Vessel.	2nd Vessel.	3rd Vessel.
	208 deg.	188 deg.	126 deg.
	20 deg.		66 deg.

It will be thus seen that, in the case of A and B, the difference of the temperatures of the 2nd and 3rd vessels is about double that between the 1st and 2nd, and in the case of C., more than thrice. This increase of difference in the latter is due to the higher proportion of pump power, giving an extremely low boiling point in the last vessel, while that of the first is comparatively high. This has a bearing of considerable importance on the question, and will be alluded to later on. The results in the case of C., also express the working figures under extreme

conditions, conditions more representing the Triple Effect of to-day than those of A. and B.

The B. figures are also specially interesting, as this triple has its heating surface distributed between the vessels in the proportion of 4 : 5 : 6, whereas that of A. and C. is equally divided.

Before dealing with the figures before us, let us now obtain an expression for the evaporation in the respective vessels, still keeping to the triple form of multiple effect for the sake of simplicity. I propose to omit disturbing conditions arising from variation in specific heat, increase of boiling points due to density, &c. These are small items, and not sufficient to affect general conclusions, while the first opens up so many uncertain points as to the manner of its application, that as much error might arise from its introduction as by its omission. In fact, I will suppose that water only is being dealt with :—

Let A_1 = Evaporation in 1st vessel in lbs.
A_2 = " 2nd "
A_3 = " 3rd "
t_1 = Boiling temp. of 1st vessel.
t_2 = " 2nd "
t_3 = " 3rd "
L_1 = Latent heat corresponding to temp. t_1
L_2 = " " " t_2
L_3 = " " " t_3
and W = Weight of water entering 1st vessel, in lbs.

Then

$$A_2 = \frac{A_1 L_1}{L_2} + \frac{(W - A_1)(t_1 - t_2)}{L_2}$$

and

$$A_3 = \frac{A_2 L_2}{L_3} + \frac{\{W - (A_1 + A_2)\}(t_2 - t_3)}{L_3}$$

Applying these formulæ to the results of Triple Effect C.

$t_1 = 208$ deg.
$t_2 = 188$ deg.
$t_3 = 126$ deg.
$L_1 = 967$
$L_2 = 982$
$L_3 = 1026$

the respective Evaporations come out as

In 1st vessel A_1
„ 2nd „ $A_1 \cdot 9643 + \cdot 0203W$.
„ 3rd „ $A_1 \cdot 8042 + \cdot 0786W$.

From these figures it is evident that two opposite influences are at work, the one the increase in the latent heat from reduction of boiling point, tending to reduce the evaporation as the series progresses, illustrated by the $\underline{A_1}$ figures and the other the extra number of units of heat brought into play by the lowering of the boiling points of the bulk of liquor going forward, expressed in terms of W; and it would appear that it is these opposing conditions which produce the phenomenal temperatures noticed, the latter more than counterbalancing the effect of the former.

Thus, not only has the heating surface in the 3rd vessel to deal with the vapour originally derived from, but less than A_1, but also with that represented by the sensible heat, $(t_2 - t_1)$ and $(t_3 - t_2)$ given up by W_1 and W_2.

Under these circumstances unless these two conditions are complementary, some variation in the intermediate temperature or temperatures might be expected, according to the varying relations of W. to A_1, but although these have not been noticed, it may be that the variation has not been sufficiently pronounced to be visible under the conditions of experiment.

It has been already pointed out that, with the Triple with greater range between the initial and terminal temperatures, the difference between the boiling points of the 2nd and 3rd vessels is much greater than where the range has been less, and this would suggest that HORSIN-DEON'S vapour theory also comes into play.

There, therefore, appears to be some justification for concluding that the hypotheses already given afford a solution of the problem involved, but unfortunately, there is evidence which cannot be overlooked which implies that the question is far from being answered.

If increasing strain on the heating surfaces is at the bottom of the throwing back of temperature, the increasing proportion of these should remedy this, tending to bring the temperature differences down to $\frac{t_1 - t_2}{n}$. The results, however, for Triple Effect B conclusively shew that this is not the case. Here is a Triple Effect, with heating surfaces in the proportion of 4 : 5 : 6 : exhibiting pretty much the same relation of temperatures as Triple A, when the heating surface is evenly divided among the vessels. If HORSIN DEON'S vapour theory be correct, if the increasing duty and lower heat transmission powers hypotheses are to be maintained, the relation of temperatures of Triple A should be distinctly different from that of B, tending to equality with the latter. As a matter of fact, however, with a nearly equal range of temperatures, the difference is greater in the case of B.

I have for some time thought that perhaps the true solution would be found in the tendency of a Multiple Effect to equalize the evaporation of the vessels. Were this the case the position could be readily explained. Temperatures observed would then be common to effects

of all proportions of heating surface, and a really comprehensive hypotheses afforded.

To this end I have endeavoured to collect data from the experience of others, but with practically no result. The essential part of such evidence would be the actual measurement of the calandria waters, and the relation of these to the total evaporation, but of data of this description there is little or none procurable. The usual arrangements for dealing with calandria waters do not end themselves to observations of this nature, and the difficulties in the way of long and tedious experiment in times of general work are great. Again, to directly measure the evaporation in the last body is impossible, while to calculate it from differences of density is to fall into copious error, from the almost inevitable variation of density throughout the vessel.

I have quite recently succeeded in obtaining an apparently reliable series of observations in this direction with Triple C. While the results of these point to equality under varying conditions of evaporation as far as the 1st and 2nd vessels are concerned, the sum of these deducted from the whole, leaves a small excess for the 3rd vessel. At present I am not prepared to say, in the absence of direct estimation, that this excess is not due to experimental error—from the countless small causes which bristle round experiments of this nature; but the close agreement of the figures for the 1st and 2nd vessels, under conditions of evaporation varying from 56 o/o to 75 o/o is remarkable.

I need not point out the extreme importance of more intimate knowledge than we at present possess of the physiology, if I may term it, of Multiple Evaporation

It is true that great strides have been made during the last decade in the direction of greater efficiency, but the solid fact still remains that even the question of relation of size of vessels as regards heating surface is a vexed one. What is wanted is more experimental evidence, obtained under working conditions, and particularly on the proportions of work done by the several vessels, and it is with the hope of inducing such observations that the preceding remarks have been put forward.

The Future of the Negro.

By the Editor.

THE future position of the American negro has been virulently discussed during the last few years. Such expressions as "The South for the negro" and "Banishment or extermination" have been muttered by blacks and whites in the United States, and a great deal has been said on both sides. We should like to say a few words on the matter from the standpoint of the naturalist.

The negro race has been developed in Tropical Africa, and in comparing it with other races we must not expect it to be on a par with the people of Europe. Accepting the theory that the Indo-European race originated in Central Asia, from whence various migrations took place towards the north-west and south, we find the tropical section less advanced than that of the temperate region. It follows therefore that if what is generally admitted to be the highest type of man has stood still, or even degenerated, from the accepted standard, as he got nearer the equator, the man of Tropical Africa would naturally in any case be somewhat backward.

But, it does not follow that the child of the sun is really backward because he does not come up to the standard of the European. Every race has been developed to suit its environment, and there can be no question that the negro is as well fitted as the European for the country he inhabits. He is at the top of the tree on his own particular line as the other races are on

theirs. This reminds us of the vulgar error that Darwinism is supposed to teach that man was evolved from an ape. No such thing! The ape is at the top of his own line, as man is of that other which probably commenced near the same point. To speak of one species or even race being *more* highly developed than another is an absurdity. Each is at the head in a way which makes it distinct, and which enables it to hold its own in the great struggle for life. If all had the same weapons of offence and defence, there would probably be greater risk of extermination, but as it is, every one has some little peculiarity which tends to his safety.

From this stand-point the negro is supreme in his own province. We may even state that his physiological peculiarities fit him for his position in the world. As far as colour goes the dark man, whether he be negro, East Indian or American, is best suited to the tropics. The reason why there are no very dark Americans is probably because the race did not originate very near the equator. On the contrary, the negro is almost certainly the original tropical man, and as such comes nearest the common ancestor, who seems to have arisen in a climate that was sufficiently genial to render clothing needless. Those who have seen the natives of Guiana in the forest will at once recognise the fact that a dark skin is protective in many ways, in fact, where a naked white man would strike the traveller as an incongruity, the nude Indian is not even indecent. To the naturalist an European landscape with nude or half-nude figures, makes him think of the necessity for coverings, but a tropical scene with its naked aborigines is on the contrary quite harmonious.

As a man the negro is not generally repulsive to Europeans. True, there are ugly blacks, as there are ugly whites, and in many cases fashion tends to exaggerate these physical drawbacks in both races. The negro was naturally unembarrassed by clothing, and therefore it will be many ages before he discovers a dress to suit his complexion. The dark Hindoo, on the contrary, has worn clothes for ages, and shews in his costume that evolution has been at work to produce such beautiful harmonies in colour. To suppose that what would suit a white will also be well fitted for a black is to suppose an impossibility. But, when white women are so utterly deaf to all remonstrances against deforming their bodies and feet, and wearing ugly-shaped dresses, what can we expect of their black cousins. We have seen black women with simple white frocks and white embroidered handkerchiefs on their heads who looked far more handsome in the bright sunlight than any pale washed-out complexioned Europeans, yet the majority cannot see the suitability of these coverings but flaunt in all the colours of the rainbow.

Judging by the habits of the negro, we may presume that his ancestor was a nocturnal animal. As we approach the Torrid Zone we find everywhere a tendency to indulge in the noon-day siesta, but in no race is this characteristic so highly developed as the negro. He will sleep in any position and under almost all circumstances. We have had the steersman of our boat fast asleep with his paddle in the water, and have also had to send an Indian in a canoe to wake our boatmen who had let their bateau drift out into the open river, while they lay asleep in it. A score of people bawled out

from the landing, but it was not until the Indian woke them up that they found out where they were going.

Sometimes, when tired of sitting in the bateau for hour after hour, we have almost envied our men this capacity. At night, on the contrary, they remain wide awake for hours chattering away like a lot of parrots. But, to see the nocturnal habits of the negro you must attend a ball or wake, when you will find him at his liveliest in the small hours of the morning. Of course he is a great nuisance to people who go to bed at regular hours, and unfortunately his concert cannot be treated like those of the cats and dogs.

The most remarkable peculiarity of the negro as compared with other uncivilized races is his capability of living with the white man. Although his heredity is very pronounced, he has a great power of accommodation to circumstances, and this has saved him. The American Indian refused and still refuses to be a slave, the negro bore the yoke almost complacently. Serfdom was abolished mainly from within—negro slavery from without. Here is a striking difference. Nations and races who refuse to remain in servitude may die out or recover their freedom by their own efforts. The struggle for independence and emancipation is elevating, and often initiates a progressive advance in civilization. If the negro had gained his liberty by his own efforts there would have been all the better prospect for his future. But, unfortunately the humanitarian interfered, with the well-known result.

Nature teaches that every living thing must work out its own salvation. The incentive to progress, although a response to outside pressure, must be innate, and this is

the great difficulty in all attempts to reform alien races. It is impossible to develop one people on the lines of another; heredity is against it. Every attempt to introduce European civilization into India has met with the failure it deserved. In some respects the morality of India is above that of Europe, notably in kindness to animals and humanity. The British Government sees this, but while respecting what they call the prejudices of the natives, they hardly try to put themselves in their place. Those Europeans who are trying to improve the condition of other races should first thoroughly acquaint themselves with the higher teachings of their religions and customs, and use these as a basis.

Anthropologists class the negro with children of other races, and every trait of his character points to the conclusion that this is his right position. In Africa he may be put down as a boy of seven or eight years, docile to a certain extent, but with capabilities for mischief which sometimes cause difficulties. In the West Indies he has advanced a stage and become the ne'er-do-well of fourteen to sixteen, the type of which causes so much trouble to parents and teachers. At this stage the negro generally remains through life, and schoolmasters say that although as a boy he advances rapidly, in later years he remains at a stand-still. Admitting the fact that the West Indian has advanced upon his African ancestor, we may hope for his further progressive development as one generation succeeds another.

As proof that the African negro is wanting in manliness we may adduce the fact that his hair is deficient. This is even more strikingly noticeable in the Chinese and American Indian. The Mussulman swears by his beard, and to

interfere with it is a great insult. The African is decidedly wanting in this respect, but it is noticeable that the West Indian, when he leaves it alone, often has a fine crop of hair in his face. Another peculiarity of the negro that also tends to prove his youth, is his measurement round the loins. Medical men who have occasion to order trusses notice that the sizes for full-grown negro men are the same as those for the youth of white races.

As the youth is father to the man, we may presume that, given a suitable environment, the negro will go on progressing, but it does not follow that his development will be on the same lines as that of the European. Those nations which have risen to positions of eminence among most races, have not been on a par with each other—in fact it is very difficult to say which was highest. The civilizations of Peru, China and India were different from those of Egypt and Greece, but not necessarily lower—each was suited to its time and place. The evidence that the negro can live in presence of the white, while the American Indian cannot, goes to prove that he has latent capabilities of a very high order. It is also curious, that he is steadily increasing in numbers in the United States, although the territories he inhabits differ much from his tropical home. It is not even impossible that he may at some time compete with the European in temperate climates, although many generations will have to pass before such a position is reached.

Civilization is largely the result of pressure of circumstances. These circumstances vary in different countries—in one the fight is with a barren soil and hard winters, in others with brute and human foes. Slavery was one of these circumstances ; it had its good effect, although

no doubt the system was degrading to both master and man and a slur upon humanity. Yet, as a result, the negro was brought into contact with the white man, and has carried something of what he was taught to his brethren in Liberia and Sierra Leone. Whatever may be said against slavery, we think all will be ready to admit that the West Indian descendant of the "prime Gold Coast negro" of a century ago is far ahead of his cousin who remained at home And, if such is the case, why should we stigmatise slavery as unutterably bad. Some good has resulted from it, and were we to admit that every charge of the Anti-Slavery party were true, the cruelties of the planters were nothing compared with those of the potentates of Dahomey and Ashantee. From the teleological stand-point everything happens for some good purpose, and therefore every so-called evil is a blessing in disguise. Slavery had its use in the economy of the world, and helped to bring different races into contact, whereby like diamonds polishing each other, each might be improved. Even the feeling of humanity itself is the outcome of sympathy with the oppressed, and could not exist where neither pain nor difficulty could be found. When we judge other races by our own standard, we are liable to fall into serious error—to the naturalist each has its own peculiarities and advantages, and, unless obviously degraded, deserves respect. We do not think that the American negro has degenerated, but that he is advancing slowly and surely on his own lines.

*Central Factories.**

By F. I. Scard.

THE evil times into which the Sugar Industry has fallen of late, have caused considerable attention to be directed to the Central Factory system as a means to further economy in cost of production, and a definite proposition has been made to establish such an institution on the East Coast, Demerara. Much has been said on the various points involved and as a further contribution, the following brief exposition of my views on the subject—views formed from experience of both systems—will not, I hope, come amiss.

In dealing with this subject, the main points to be considered are

Size of Factory.
Transport of Canes.
Form of Factory.
Site of Factory.
Basis of Payment for Canes, and
Constitution of Factory.

Size of Factory.—In determining the minimum for this, it should be remembered that the existing Demerara estates are fairly well supplied with machinery and means of extraction, and that the advantages from the introduction of the Central Factory system must be sought, not so much in improved extraction—although this would occur to a certain extent, as in the economy arising from a large output combined with the utmost simpli-

* Read at the May Meeting of the Agricultural Committee.

city. This is a most important point, affecting, in fact, the success of the whole scheme. Thus a cane-grower, already possessing a factory with an output, say, of 200 tons of sugar per week, would probably derive no benefit from selling his canes to a factory turning out four or five hundred tons, from the lesser price the latter could afford to give for them. If, therefore, the cane guaranteed at the outset is not sufficient to provide work for a factory of economic size, it would be useless going on with the scheme without a good prospect of further and adequate supply in the near future. This minimum size should be, I consider, a capacity for an output of 1,200 tons of sugar per week, or a disposal of somewhere about 2,180 tons of canes in the 24 hours. Provision should also be made for the gradual development of a minor farming industry, towards which too much attention cannot be directed.

To meet the case of a small supply of canes at the outset, with subsequent expansion, it has, I believe, been proposed to erect the Factory house large enough to admit of a duplicate plant being erected alongside the first. This would, in my opinion, be a fatal error; the concentration which is the sum and substance of success in Central Factory work not existing, save in such small items as staff, etc.

Another question of primary importance is *Transport*. The present water system no doubt admirably suited the small estates and elementary factories which originally constituted the sugar industry of the colony, rendered more efficient by the control of labour given by the slave system; but it cannot now be looked upon as affording a satisfactory mode of bringing canes to the mill. Slow-

ness of haulage, injury to canes by this, and contact, often prolonged, with water, and trouble from shortness of water in dry seasons, all tend to render the system as things are now extremely objectionable, while its cheapness as compared with railway haulage has been much exaggerated. When the cost of upkeep of navigation trenches, mules, punts, water supply, etc., is fairly taken into account, and the evils of the system are added to these objections, I am sure no doubt will remain as to which is the preferable method.

The actual cost of the railway haulage of canes for the last two crops of a Central Factory in a neighbouring island, making 700 tons a week or thereabout, has been 39 cents per ton canes, this including maintenance of rolling stock, permanent way, locomotive shop, running expenses, supervision, etc. and carriage of sugar and stores to and from shipping house respectively. The railway is of standard gauge—4 ft. 8½ in. and 35 miles in length, including branches and sidings.

As against this I have the corresponding figures for an estate on the East Coast, which may be taken as fairly representative of the district of the proposed factory, and these come out 34 cents per ton canes for the same period as above.

Of course, the extra interest on the larger capital required for the railway system would increase somewhat the above difference, but this would be nothing compared with the benefit to the manufacture resulting from railway haulage.

I do not advocate, in fact, it would hardly be expedient, to change from one system to another our estates as they are now, but, in considering the establishment of

a large Central Factory, the success of which would be dependent on the efficiency of its transport service, not the slightest doubt exists in my mind as to which should be the system adopted. Indeed, I will go further, and unhesitatingly affirm that the question of water carriage should not even be entertained in connection with such a scheme, and I make this statement on an actual experience of the two systems extending over many years.

A few figures may help the realization of the uusuitability of the water carriage system for a factory of the size under consideration. To supply the 2,100 tons of canes per day, about 800 punt loads would be required, the difficulty of hauling which would be insuperable. Every evening, to secure the mills being kept in canes throughout the night, at least 400 loaded punts would have to be on hand. Every two minutes or thereabout, an empty punt would have to leave the carrier, and a full one take its place. These 400 punts would occupy, closely packed, an area of over two acres, which, if extended in line along a canal would form a chain two and a quarter miles long.

As against this, a truck occupying the area of a cane punt would hold 15 to 20 tons of canes, or 6 to 8 times, what a punt would, and the space occupied, and handling necessary, be diminished in like proportion.

Another point, which at first sight seems a minor one, but which is really of the utmost importance, is that of being able to weigh separate lots of canes. Under the punt system this is practically impossible, and without the means for doing this, there would be no data for the purchase of the canes.

As an argument against the adoption of a railway

scheme in connection with the proposed factory, it has, I believe, been adduced that double handling of canes would be thereby necessary, and consequently greater expense incurred, this view being based on the assumption that canes would be loaded into punts in the ordinary way, and then transferred to trucks at the loading stations.

There is no occasion whatever for this, and such a practice would not only mean an expensive and tedious operation, but would also tend to perpetuate the evils of a system which it is extremely desirable should be abolished.

With the main line running as much as possible along the back dams, or at any rate parallel to them, branch lines should run through the estates in such a manner that canes could be "headed" into the trucks. With estates possessing a façade of not over 100 roods these branch lines could be run along the middle walk dams, and beyond this frontage up the middle of the fields, the present navigation trenches being utilized for draining purposes. Or, the side line dams could be turned to account, so that the extreme "heading" would be 200 yards and the mean, 100 yards, which, from what I have seen elsewhere, is quite a workable distance.

With regard to the cost of laying down such a railway, £1,500 per mile, should cover the construction of the permanent way. In an undulating country, necessitating far more earth and concrete work than here, I know that from £1,500 to £2,000 is established as the cost *i.e.* with 4 ft. 8½ in. gauge and 50 lb. rails. The branch lines, which would form the major part, could be constructed

for much less than this, so that £1,500 per mile may be looked upon as a fair estimate of cost for the whole.

Form of Factory.—There should be no difficulty in determining the lines on which the Factory would be constructed. The great point to be aimed at should be extreme simplicity coupled with the most efficient appliances obtainable. *No portion of any existing plant should be incorporated,* as some weak part might exist to prejudice the whole.

For several reasons, principally on the score of difficulty in handling extreme weights, it would be advisable to duplicate the mills, but the rest of the factory should be simplicity itself. Four or five boilers, two furnaces, one to each set of mills, megass arrangements working as automatically as possible, one multiple effect, two vacuum pans, a massecuite installation involving a minimum of handling, a distillery on modern lines, these are all matters which could be settled in a perfectly satisfactory manner, and result in a factory which, when the working was once organised, would be far simpler and give less trouble than our present more or less composite buildings.

It would be distinctly unwise to hand over the erection of the entire plant to a single engineering firm. The scheme of the factory should be formulated here, and the different parts given for construction to those firms who have proved themselves specialists in the respective departments. Proceeding thus, there would be some guarantee of uniform strength throughout, and the factory would be free from the defects which invariably accompany entire construction by any one manufacturer.

Site of Factory.—While proximity to the river would materially assist erection, yet for working purposes, it would be advisable to have the factory as nearly as possible in the centre of reaping operations, on account of the increased facilities thus given for transporting canes. To establish the factory at the extreme end of the district would not only mean double the amount of haulage, but more trouble in regulating the transport. The selection of site, therefore, entirely depends upon the extent and direction of the district comprising the cane growing area.

Payment for Canes.—The amount is necessarily somewhat a vexed question, and would depend in great measure as mentioned above, upon the size of the factory. With a factory turning out 1,200 tons per week, it would I think, be possible to give 6½ o/o in sugar at current rates* for grey crystals on the weight of canes supplied, the factory taking over the canes when loaded in the trucks. There need be no sliding scale for varying densities of juice, as the variation in this is astonishingly small when the average of crop is taken, and as, if the factory be constituted as below, any advantage or disadvantage arising from such variation would be shared by the cane growers. The difficulty of individual farmers growing purposely heavy, but inferior canes, is one which would not be likely to arise in practice, as the density of the juice depends more upon seasons than the treatment the canes receive, save under such conditions as would lead to loss on the part of the farmers. I have had many opportunities elsewhere for comparing the

* When this was written, refining crystals were quoted in Georgetown at $2 25 per 100 lbs., 96° polarization.

juice from small farmers' canes, farming, perhaps, an acre of land by their own labour, and that from estate canes, and have concluded that practically there is no difference. Of course, the question of drainage is an important one here, but, although want of this would seriously prejudice the working qualities of the juice, its density would not be much affected, and it would be impossible to differentiate as to the former.

Canes sent in old, badly cleaned or topped, should be rejected, or a reduction in payment made, but this is a matter which must be left to the manager of the factory, who should have absolute power in this respect.

From some years connection with Central Factory work, I feel sure that many apparent difficulties in dealing with this question would disappear in practice.

Constitution of the Factory.—The best method, probably, would be for the cane growers to be shareholders, at a nominal figure in proportion to the amount of canes supplied by them. The necessary capital could then be raised on debentures and guaranteed as regards interest by Government. The profits would first be devoted to the payment of this interest, then to the establishment of a sinking fund for the redemption of the debentures. Any profit after this would be divided among the shareholders, *i.e.*, the cane growers, in proportion to the canes supplied. The control should be in the hands of a Board of Directors, on which all interests should be represented.

The above, I think fairly covers the principal points to be considered in the inception of a Central Factory scheme for Demerara conditions. The first step to be taken should be to secure undertakings from cane growers in the district as to the average amount of canes they

would supply to the factory. It could then be considered whether the quantity would be sufficient to justify the erection of a Central Factory. Until such a definite basis is arrived at, it would be waste of time to go into details of construction and work.

I believe, and firmly believe, that the adoption of the Central Factory system in Demerara would do much to produce a favourable change in the present depressed condition of the Sugar Industry here; but it should be clearly understood that unless these factories are constructed on the lines of extreme simplicity associated with economic magnitude and facile transport, disappointment will inevitably result.

The Materials of the Urali Poison.

By J. J. Quelch, B. Sc. (Lond.), C.M.Z.S.

THIS native South American poison, so largely made and used by the Indians of the interior districts of the colony, has for a long time attracted considerable attention; but in spite of numerous researches, it can hardly be said that we have yet a definite knowledge of its constitution. The reason for this, however, is not far to seek. We know for a certainty that the materials used in its preparation vary according to the individual makers, and the localities from which it is obtained: that, in fact, this native poison is not a simple and definite body, but a varying mixture of very different elements.

It has long been known that many poisonous barks and roots, together with the fangs of poisonous snakes, the bodies of stinging ants, pepper, and certain innocuous roots and stems, are used by the Indians in the manufacture of the Urali. But it is worth while drawing attention to this other fact (since it is not always sufficiently recognised) that there is no uniform or fixed prescription, so to speak, among the native peoples as a body, and that, other than the Urali bark proper, which is an invariable element in all preparations among our Indians, the other poisonous materials used by any two makers may be quite different.

That the active principle of the Urali plant *(Strychnos toxifera)* is in itself a deadly poison, has already been clearly demonstrated; but so far we are quite ignorant

of the extent to which its action is increased or modified by the active principles derived from the various other materials used. The careful examination of these constituents has, therefore, become a matter of considerable interest; and the rough materials used for the production of the composite Urali poison, have become desiderata in many of the chief experimental laboratories.

The great difficulty hitherto has been in procuring them from the interior of the country. On the one hand, the region inhabited by the Urali makers is situated far from the coast, and is reached only by a protracted river journey entailing a considerable expenditure of time and money, and a great deal of hardship, if not of danger; while on the other, those Indians who occasionally visit the coast, and are familiar with the poison, either pretend to be, or actually are, ignorant of the requisite materials, or, at any rate, have never been persuaded to supply them.

In a recent journey to the Great Savannah with Mr. F. V. McCONNELL, an opportunity was afforded, in December 1894, of visiting the Kanuku mountains—that isolated and abrupt range that rises from the low-lying savannah eastwards from the Brazilian frontier—from the northern and southern parts of which the Makushi and Wapishiana Indians, respectively, obtain the various barks and roots used by them in their manufacture of the Urali; and we were thus able not only to make a collection of such samples, but to learn two methods of preparation, or prescriptions, which will serve to illustrate the varying composition of the poison.

More than eighty years ago, as he relates in the fascinating pages of his "Wanderings in South America,"

the intrepid WATERTON trod these same districts in his desire to obtain the very strongest Urali; and in that classic work he placed on record an account of the materials, and the method of preparation, used in those days. To SCHOMBURGK, also, in his standard work, the "Reisen in Britisch Guiana," we are indebted for observations on the same points, made some thirty years later, when he, too, travelled through the same region. It will be both interesting and instructive, as an illustration of the very variable nature of the poison, to reproduce here the older prescriptions, so to speak, as given by these two travellers—so far as the names of the materials are concerned—in order the better to contrast them, not only the one with the other, but also with those of the makers of to-day; and at the same time to bear in mind that these very different methods have been practised by peaimen of the same tribe, living at but short distances apart in the same savannah district.

The materials enumerated by WATERTON include the following:—

1. The bark of the Urali vine—the principal ingredient.
2. The outer part of a root of very bitter taste.
3. Two kinds of bulbous plants, containing a green and glutinous juice.
4. Two species of venomous ants.
5. The pounded fangs of two species of venomous snakes.
6. Finely-pounded, strongest Indian pepper *(Capsicum)*.

Those recorded by SCHOMBURGK on the other hand comprise:—

1. The bark and sap of the Urali *(Strychnos toxifera.)*

2. The bark of the Yakki *(Strychnos Schomburgkii)*.
3. „ „ Arimeru *(Strychnos cogens)*.
4. The bark and root of Tarireng.
5. The bark of Wokarimo.
6. The root of Tararemu.
7. The bulbous root of Muramu *(Cissus sp.?)*
8. Pieces of Manuca wood (very bitter and poisonous.)

While making enquiries in order to obtain these materials mentioned by SCHOMBURGK, we found that there lived at the village of Waipokari, situated close to the Rupununi River, some thirty miles north of the Kanuku range, a Makushi peaiman, who was famed over the district as the maker of the best and strongest poison. This "medicine-man" was already somewhat known to us, for some weeks previously, at the village of Kwaimatta, where our depôt was established, he had disturbed the entire tranquility of the night by his peculiar incantations while driving out the so-called bad spirit from a fever-striken child of one of the headmen of the village. From him we obtained by good payment, not only samples of the poison itself, but also of the various materials used by him, as well as a good deal of miscellaneous information respecting the preparation by himself and other makers.

Evidently the peaimen are but little averse to imparting such information, probably because among these simple folk, the excellence of the poison is regarded as especially dependent on the professional observances to be gone through during the time of preparation. A single observance—that of fasting—will sufficiently illustrate this point. Thus the greater the abstention from food on the part of the peaimen, the greater the virulence of the Urali, its action being supposed to be

deadly in correspondence with the degree of hunger of the maker.

The materials as used by this peaiman include the following:—

1. Bark of Urali *(Strychnos toxifera.)*
2. ,, Arimeru *(Strychnos cogens.)*
3. ,, Tung.
4. ,, Kenaima-inda-kuripichi.
5. Bulbous root of Muramu *(Cissus* sp.?*)*
6. Mucilaginous stem of Ekoi-aipa.

Of these constituents, *Muramu* is a thin yam-like vine with irregular bulbous roots, and *Ekoi-aipa* a cactus. Both of these are stated by the Indians to be distinctly innocuous, and are only used as mucilaginous bases for the poisonous substances. *Urali* and *Arimeru*, both species of Strychnos, are vines with poisonous principles, though at present nothing is known as to their relative virulence; while *Tung* and *Kenaima-inda-kuripichi* are both trees, apparently unknown to science, but containing active poisons.

The difference of this prescription from that of WATERTON, and its general resemblance to that of SCHOMBURGK are at once apparent; but its points of difference from the latter are still sufficiently noteworthy.

At Waipokari, also, we met another Makushi peaiman who had just arrived from the Kanuku mountains, at the foot of which he lived. He was then on his way to the central station Kwaimatta, where the Makushis are accustomed to assemble, even from great distances, for the Christmas celebrations of games, dances and paiwarri feasts. After a little persuasion and promises of good payment, he agreed to accompany us to the moun-

tains, and to shew us where the Urali vines grew. So abundant, indeed, are these plants in a certain northern district of the Kanuku range, that it goes commonly by the name of the Urali mountain.

Taking boat at Waipokari landing, we started for the upper reaches of the Rupununi, and passed the Urua rapids, where masses of dense and vesicular diorite obstruct the river. Just below these rapids, on the elevated right bank, is the site of the old Mission of the Church of England now thickly overgrown with forest, and more especially by the large and strikingly handsome "Urua" palms *(Attalea speciosa)* so characteristic of this district. A few miles above, near the base of the Urali mountain, the river narrows rapidly, and becomes so shallow in the dry weather as to be almost unnavigable. Here we left our boat and struck off inland through the dense forest to reach the higher slopes of the hills. On the lower levels, which are chiefly remarkable from their peculiarly rich and highly ferruginous clayey soil, the commoner poisonous materials occur; but the Urali vine flourishes on the upper part of the mountains, where the gneissic and schistose rocks, of which they are composed, become more massive and abundant the higher one ascends.

About a couple miles in from the river, on a slight elevation, we came upon the lonely residence of the peaiman, where, in a partially cleared opening that had formerly been a large provision field stocked with cassava, corn, yam, pine, papaw, pumpkin, potato, banana and sugar cane, were three more or less dilapidated houses in which a few sickly-looking women and children had been left behind with the dogs. A few miles inland rose the

gently-sloping council peak of Urali mountain, covered with forest to its summit.

Closer to the base of the hill, we passed some finely grown lime trees, covered with large fruit, still holding their own against the over-crowding second bush. Here no doubt was the site of some former important settlement—probably one noted for the manufacture of the poison; but our peaiman gave no information about it. 'Tis a melancholy and striking fact, and one indeed that awakens the reflection of the traveller, whether along the lower or higher reaches of our rivers, or on the open plains or elevations of the savannah, that, in all directions, are to be found the sites of once flourishing and often populous settlements of the Redman, where to-day the only vestiges of his supremacy are the scattered hardy remnants of his once extensive provision fields, or the few struggling representatives of the plants that for purposes of special utility he grew in the neighbourhood of his houses.

After about an hour's climb to a height of nearly 1,000 feet, we came upon the region of the Urali, and our peaiman quickly pointed out the somewhat slender vines climbing up to the forest roof. Here, too, occurred other climbing plants such as the *Yakki*, *Arakwa*, and *Roraibong*, all apparently species of Strychnos, together with the *Ratsha*, the bitter and poisonous root of which is scraped and used, with the scraped bark of the others, for the poison.

To our great disappointment, none of the plants were in flower or fruit—just as happened to SCHOMBURGK in his first attempt to procure them; and we were obliged to content ourselves with a collection of their leaves,

and of their stems or roots according as they are utilised. The Indians indeed say that the plants are in flower just after the heavy rains have begun, but we had no opportunity of returning to the district later, being due in Georgetown at the end of the year.

The shape and venation of the leaves of the Urali plant and their very dense hairiness—a character which is equally marked on the younger stems—will readily distinguish the species from all others. In spite of the very bitter taste and presumably poisonous property of these leaves, certain small insects fed abundantly on them; and on the lower part of the stem there were but few that were undamaged.

Though the Urali plants are regarded by the savannah Indians as being strictly localised to the Kanuku mountains, there can be little doubt that the species occurs in many other elevated parts of the colony where the temperature and moisture are suitable, and indeed it has been already recorded by SCHOMBURGK from the Sururu, a tributary of the Pomeroon. It has not, however, been put to similar uses by the other tribes near the coast.

In addition to the plants already named, our peaiman collected for us the bark of a large tree, known to the Makushis as *Komatana*, and said to be very poisonous; and these with the *Muramu* and *Ekoi-aipa* made up his materials for the Urali, which thus stand as follows:—

1. Bark of Urali *(Strychnos toxifera.)*
2. „ Yakki or I-a-ki *(Strychnos Schomburgkii.)*
3. „ Arakwa *(Strychnos* sp.*?)*
4. „ Roraibong *(Strychnos* sp.*?)*
5. „ Komatana.
6. Root (bark of) of Ratsha.

7. Bulbous root of Muramu *(Cissus* sp. ?)

8. Mucilaginous stem of Ekoi-aipa *(Cactus.)*

It will be at once seen by a comparison of this peaiman's list with the three former, that while it is markedly different from that given by WATERTON, it bears a general similarity to those given by SCHOMBURGK and the other peaiman, though it possesses distinctive peculiarities of its own.

Many of the materials mentioned by SCHOMBURGK seem not to be now used, at any rate their names were not recognised by the peaimen met with. Possibly they may have been Wapishiana terms, though SCHOMBURGK gives them as Makushi. It is at least clear from the statements of the makers, that the Urali plant is the only one which must be used by all peaimen, the other materials depending upon what can be procured with convenience from their locality, wherever that may be; and this, too, is borne out by the lists. The leaves of another plant, known to the Makushis as *Waiamuri-prakung*, were also brought us, its bitter and poisonous root being scraped and used by peaimen. It is to be noted that the venomous ants, and the fangs of the venomous snakes of WATERTON'S list, no longer figure in the Urali prescriptions.

The foregoing may be said to be a summary of present observations on the materials used in the preparation of the poison. It only remains to add a few words on the method employed. As would naturally be expected among a primitive community, the peaimen go through a series of more or less absurd special observances during the preparation, which are regarded by them as of great importance, if not essential, to the

excellence of the poison; but the only essential condition lies in making a strong infusion of the various barks or roots, and in evaporating it till a thick, concentrated liquor is obtained. For this purpose the poisonous barks and roots are scraped off into thin pieces or shavings—the inner woody tissue being of no use—and, as will readily be understood, the quantity of the Urali bark used is largely in excess of the others.

WATERTON relates that the scraped barks were placed in a colander of leaves, through which a large quantity of water was poured, which, on passing through, became of a dark colour. To this water the glutinous juices were added, with the pepper, pounded fangs of snakes and the ants' bodies, the whole being gently heated until a dense syrupy liquor was obtained.

IM THURN relates a slightly different method, in which the shavings were gently simmered on the fire in a large quantity of water, the scum being frequently removed, until when the liquid was quite concentrated it was strained off from the barks. The fleshy roots were similarly treated in a separate pot, and the concentrated essences then mixed to make a thick and dark syrupy mass.

Our two peaimen's method again was slightly different from both of these, in that the bark and root shavings were soaked for a few days in a large quantity of water and then filtered off. The mucilage of the cactus, and the inner fleshy parts of the Muramu were then added to the infusion, and the whole gently simmered on the fire —the scum being frequently removed—until it had become a thick, dark liquid—when it was poured off into the small vessels in which it is usually kept for use.

In all preparations a great deal is made of the condition that the pots and strainers used should be new. The only point here to be really considered is that the vessels should be perfectly clean; and to those who have experience of the condition in which the vessels about an Indian's house are kept, there will be no difficulty in understanding how it became a necessary observance that the vessels should be new, in order that they should be of the desired state of cleanliness.

From experience each peaiman knows, more or less exactly, the quantity of the various constituents to be used, and the time required for the infusion to be of the necessary strength. The poison, however, is tested as soon as it is made, and if its virulence is not quite satisfactory, more of the infusion is added, and the mixture again slowly evaporated.

Though its real composition is not accurately known, the action of Urali is thoroughly understood; and from its importance in physiology, it is probable that its use will be much extended. Now that the various constituent barks have been secured, it can hardly be doubted that detailed analysis of their properties will help largely in giving us the requisite knowledge of the constitution of this composite poison.

Some Guiana Parrots.

By C. A. Lloyd.

"Thei have also many popingiayes: some grene, some yelowe, and some not muche vnlyke them of India, with redde circles about their neckes."

MUNSTER, "OF THE NEWE INDIA" 1553.

THE parrot family, or as it is scientifically called the *Psittacidæ*, is an extremely large one and contains some very beautiful birds. The total number of species known up to the present day is about one thousand. They are very widely distributed in nearly every tropical part of the world. One species only, the Carolina parrot, *Conuropsis carolinensis,* occurs in the United States where it once ranged as far north as 42°, but it is now restricted to the Gulf States and is of very local occurrence. In South America a few of the species are found in La Plata and Chili, and one, *Cyanolyseus patagonus,* even touches the Strait of Magellan. But these, with the New Zealand and Asiatic ranges of some of the *Psittacidæ*, are exceptions to the rule.

All parrots (excepting one genus which is not found here) have twelve tail feathers *(rectrices)* yoked *(zygodactyle)* feet and strongly curved and hooked, *(epigan-thous)* beaks, so that they can easily be distinguished even by the most casual observer. They are vegetable feeders, and except when in captivity never depart from this "bill of fare," though a New Zealand species, *Nestor notabilis,* is said to actually attack and destroy sheep for

the purpose of feeding on their kidneys. The habits of parrots are so much alike and so well-known that it is needless to say anything on the subject in this paper. In olden times when parrots were first taken to England they were highly esteemed and prized for their powers of imitation and were known as "popinjays." About one hundred and eighty species of parrots have been recorded from tropical America, and of these Guiana possess a fair number. This includes the macaws, love-birds and parakeets, some thirty odd species falling to her share. The two commonest parrots occurring here are the "Screecher," *Chrysotis amazonica*, and the "Saurama," *C. farinosa*; they are both green birds, and the latter is the largest of its genus found in this part of Guiana. Three other species of the genus *Chrysotis* have been reported from here, but they are not so commonly seen except as cage birds. One, *C. ochrocephala*, the true Amazon, is only obtained far in the interior and never appears to visit the Coast. The Indians assert that this species frequently breeds in company with *C. amazonica* and that young birds of both species are often taken from the same nest. It is not uncommon to meet with specimens of *C. ochrocephala* having the feathers alternately green and yellow, giving the bird a checkered appearance; this abnormal arrangement of plumage is said to be due to the feeding exclusively on Indian Corn. *C. dufresneana* is not a rare species, but is not very common and is notable as being the only large green parrot having the wing speculum yellow, found in the Colony; it is said never to learn to speak. Of our native parrots the Amazon is undoubtedly the best talker, and becomes so attached to its owner that it pines away and dies if altogether removed from his

presence. The "Screecher" can also be taught to speak, when it will equal if not surpass the Amazon. We once saw one of these birds that could speak Portuguese almost as fluently as JOHN SENHOR himself. The red-backed parrot, *C. bodini*, is a very rare bird in British Guiana, but we are told that it is common enough in Brazil. We have only seen a few specimens of this fine parrot, and they were all in a domesticated state.

One of the most curious of the Guiana parrots is the "Hia-Hia," *Deroptyus accipitrinus*. Its erectile crest and hawk-like aspect have earned for it the name of the hawk-headed parrot, and will serve to distinguish it at once from any other species. They are generally met with in small flocks of from ten to twenty, though occasionally solitary pairs are seen, but these appear to be old birds. The Sun parrot is a monotypic form, but specimens from Ecuador having the *pileum* brown instead of grey are thought to belong to a different race. The genus *Urochroma*, though a small one, numbering in all only eight species, comprises some very beautiful little parrots, three of which have been recorded from here. *Urochroma cingulata* is a perfect gem, and is known to the "Bovianders" as the "Seven coloured parakeet." It was once very plentiful in the neighbourhood of Groete Creek, but of late years its numbers have from some unknown cause become greatly diminished. The following is a short description of this gay little creature:—Adult male: Head and neck greenish yellow, the feathers of the sides of the neck and on the nape having black edges, giving these parts a scaly appearance; under parts of body glaucous green, tail pinkish rose, washed with mauve, greater upper wing

covert greenish-yellow, fading off into pure green and then to blue, a rosy streak on the bend of the wings, primary, smaller, and medium upper wing coverts black; total length, a little over six inches. The two other species of *Urochroma* are not so beautifully attired, *U. hueti* being green marked with blue on the forehead and cheeks, and having the axillaries scarlet. The tiny little love-birds are too well known to need description. They are among the smallest representatives of the parrot tribe, and though rather noisy they make amusing and graceful pets. Their head-quarters in this country appear to be in Berbice, from which locality most of those we see on sale in town are obtained. Mr. VON ZIEGESAR, who resided in Berbice for a long while, informs us that he once possessed a pair of love-birds which from time to time became the parents of twenty-four young ones, but these the old birds invariably killed and ate. In the love-birds *(Psittacula)* the sexes always differ in colour. A very common parrot about our Rivers is *Pionus fuscus*. It is a dark brownish coloured bird, having a reddish tail and recalling somewhat the African grey parrot. At certain times it is liable to be infested with wandering *nematoid* worms, and one we saw shot on the Essequebo River was so filled with these parasites as to render it a mystery how the bird could exist at all. The worms were about an inch long and almost transparent. Several species of *Brotogeris* are also reported from the colony, but they are small green birds, hardly distinguishable from each other except in size, and not very interesting from an æsthetic point of view. They generally lay their eggs in the deserted nests of wood ants (termites). *Caica melanocephala* is one of our

handsome little parrots that takes readily to domestication, becoming very affectionate, allowing itself to be handled and petted without the slightest resentment. It is particularly plentiful on the Mazaruni and Puruni Rivers, where it nests in holes high up the trunks of trees. We have often tried to get at the eggs, but could never succeed. On the Essequebo river we have met with the only examples of *Pyrrhura picta* we have seen, but it is by no means a rare bird, being found in other parts of the Colony as well. The feathers of the throat and breast have light grey edges producing a scaled appearance. In general contour it is much like a *Conurus* and might easily be mistaken for one.

To conclude any account of the *Psittacidæ* without mentioning the macaws would be like painting a flower garden and leaving out the flowers. The macaws are entirely confined to Tropical America and the genus to which they belong—Ara and its allies—comprises some of the most magnificent forms to be met with in the whole group of parrots. The red and blue macaw, *Ara chloroptera,* is really a splendid bird; the dazzling brilliance of its scarlet breast and its long flowing tail renders it a most imposing creature. It is common all over the colony but is more abundant in the remote parts of the interior, where it nests in high Mora trees. It is the favourite bird of the Macoushi Indians—no Macoushi Village is complete without one or two tame "Conarries." The nests of the red and blue macaw are placed in such inaccessible situations that even the Indian's ingenuity is baffled in trying to reach them; he is therefore compelled to shoot the adult birds with his blow-pipe. As soon as a bird is struck and falls he immediately ad-

ministers to it a dose of cane juice and salt, which acting as an antidote to the deadly Wourali, soon restores "Couarrie" to his senses, when he is taken to the Indian's hut and in a few days is as tame and accustomed to his surroundings as if he had been bred and born there. Two other macaws of bright plumage are met with in the interior, one the blue and yellow macaw, *A. ararauana*, known to the Indians as the "Warara" is frequently seen on the Savannahs, where it breeds, making its nest in the dead trunks of the Eta palm, *Mauritia flexuosa*. The Indians say that its eggs are speckled, but we were never able to prove the truth of this statement. In colouring this bird is blue on the upper, and bright yellow on the under parts, which makes it a very conspicuous and handsome species. In Brazil there is another macaw, *Ara caninde*, very like *ararauana* and differing from it only in a few characters. *A. macao* is also a most beautiful species, glowing with scarlet, green, yellow and blue—a veritable living rainbow. It is not so common a bird as its cousins mentioned above, and appears to be confined to the Savannah region.

The little green "Eta parrot," *A. hahni*, is the smallest of the macaws. It is widely distributed throughout the colony, and together with the "Screecher" parrot is in some places the most obtrusive form of bird life. It nests in dried trees, especially such as have been destroyed by fire, taking advantage of old woodpecker holes, which it often enlarges to suit its requirements. The generic name *Ara*, given to the macaws by KUHL, is said to be derived from some Indian name for these birds and is really a very good imitation of their usual note. The "Kissie Kissie,"

Conurus solstitialis, deserves notice as being the most gaudy of all the British Guiana *Conures*. We have only observed it in the Savannah country flying high overhead in small flocks. The Indians frequently bring this pretty little species to town for sale, but it does not appear to thrive in captivity. Several other *Conures* and two Macaws are known to occur in the Colony, but as they are not particularly interesting we will pass them over. Macaws have often been taught to speak, and we know a lady in Georgetown who possessed one which could pronounce its name (ROBERT) as articulately as a human being. He was a most cunning fellow and knew the breakfast and dinner hour to the minute. But alas! for poor ROBERT; his destructive propensities counterbalanced his good qualities, and his mistress was forced to give him away.

The best speaker amongst macaws is *A. ararauana*, and an instance is on record of one that not only could utter sentences distinctly but performed many amusing tricks, such as concealing a nut under his tongue and on being commanded to show it presenting it to the company. This bird was said to have been extremely fond of music, to which it would beat exact time with its feet. Many are the anecdotes told about the imitative powers of parrots, but they are so hackneyed as not to bear reiteration. We knew an Amazon that could speak wonderfully well, but unfortunately his language was most unparliamentary; he excelled in oaths and could swear like a trooper. A curious habit of some parrots is that of regurgitating their food when they are approached by those who look after them, but whether this is a sign of their esteem or not we are unable to say.

In conclusion we append a list of the parrots found in the Colony, with their local habitats as known to us :—

Order Psittaci.

FAMILY—*Psittacidæ*.

SUB-FAM. II—*Conurinæ*.

	LOCAL HABITATION.
Ara macao	... Savannah Region.
„ chloroptera	... S. America Generally.
„ severa	... Unknown.
„ macavuana	... Savannah Region.
„ hahni	... S. America.
„ ararauana	... Savannah Region.
Conurus solstitialis	„ „
„ leucophthalmus ...	... Unknown.
„ æruginosus ...	... S. America.
„ pertinax	... Rare.
Pyrrhura picta	... Essequebo River.
„ egregia	... Roraima District.
Bolborhynchus (Brotogerys) panychlorus	... Unknown.
Psittacula passerina ...	... Berbice.
„ Guianensis	„
Brotogerys chrysopterus ...	... S. America.
„ tuipara	„

SUB-FAM. III—*Pioninæ*.

Chrysotis farinosa	... S. America.
„ amazonica	„
„ ochrocephala ...	... Savannah Region.
„ dufresneana ...	... Demerara River.
„ bodini	... Unknown.
„ festiva	„
Pionus menstruus	... S. America.
„ fuscus	... Mazaruni and Essequebo River.
Deroptyus accipitrinus	„ „
Pionopsittacus caica ...	... S. America.

Urochroma cingulata	...	... Essequebo River and N. W. District.
„ purpurata	...	... S. America.
„ hueti ...	...	... Mazaruni River.
Caica melanocephala	...	... Mazaruni and Puruni Rivers.

Influence of the Labour Supply on the Welfare of the Colony.

By F. C. S. Bascom.

MEDICAL men tell us that if in any individual the important process of digestion becomes seriously deranged, the unfortunate sufferer is quickly attacked by numerous ailments, some of which are symptoms of the original trouble, and some again are genuine sympathetic affections of other functions or organs. So too there exists among communities a large class of questions, directly affecting their wealth-earning powers, which seem to cause wide-spread disorders in the body politic, if the problems to which they give rise are not satisfactorily solved by those in authority. The Labour Supply, the subject treated of in this article, is a local example of such a question.

No one who has read carefully the history of the colony can fail to be impressed by the importance of an adequate labour supply. From the very earliest times this question has thrust itself forward as one of the very first importance, and although it has been sometimes ignored, and sometimes pushed into the back-ground in favour of the political fad of the hour, it has never really ceased to be the premier question for the inhabitants of the colony; in support of which position, I appeal to history.*

The earliest form of settlement on the coast of what is now known as "British Guiana," was the trading post,

* "History of British Guiana," by James Rodway, F.L.S., being the most recent work on local history, was the one consulted by me.

which was formed as follows :—A suitable place having been selected, friendly relations were established with the Indians; the ship's company then landed, and built a storehouse in which the articles of trade they had brought were placed. A party of about ten men, one of whom was made Commander, was left in charge of the post, and to them fell the duty of exchanging the articles of trade left with them, for such products as the country yielded. It is obvious that no want of labour could make itself felt at a trading post; once established there was little or no heavy work to be done, save the unloading and loading of the ships that came once a year to take away the goods collected, and leave a further supply of articles of trade, and this of course was done by their crews. Sometimes the men in charge of a trading post would plant a few patches of native provisions around the post, and sometimes an unusually energetic Commander would make a trip into the interior with a view to introducing his wares to a larger public than was to be found in the immediate vicinity of the post. In the first case their Indian friends would be asked to help, and in the second they would be called on to act as guides and bearers; but in either case the numbers employed would be small, and the demand being only a temporary one, could not shew up the weakness of the Labour Supply. No sooner however do we hear of sugar being grown and the trading post being thereby converted into a regular settlement, than the African slave, the recognised tropical labourer of that age, appears on the scene.

Here perhaps it will be objected that all countries are hard up for labour in their early days, even countries

whose climate allows of their drawing on the surplus labour of Europe, and that therefore there is nothing peculiar about the fact that British Guiana should want labour at the start. I would however call attention to the point that it is not the circumstance that labour was wanted at the outset that I wish to emphasize, so much as the fact that the causes which gave rise to this want, are of so permanent a character that they have operated all along to delay the development of the Colony, and are so operating to this day. Let us look into this matter a little.

In the case of a country which is open to settlement by white men, the sequence of development is somewhat as follows :—The first effort of the new settlers is directed to establishing themselves on the ground, and at first all their time and energy is required for this task. Forests have to be cut down, houses built, land broken up and planted. As time goes on, however, and a certain amount of this necessary preliminary work has been done, the effort to maintain themselves no longer requires the whole energies of the young community. A start is accordingly made to produce some article which is in démand in the great world outside their limits, and as the colony progresses and the need for labour arises, the mother country is laid under contribution and a supply is forthcoming. It is true that at first it would usually be found necessary to hold out special inducements to emigrants, such as offering them high wages, and dangling before their eyes the possibility in a new country of their passing from the ranks of the employed to the position of employers, but the final issue is never for a moment in doubt, and if the immigration

into the colony is not checked by legislation, it will in the end fill the colony with people.

In British Guiana, as we have seen, the course of events was somewhat different: First, we had the temporary settlement known as the trading post, and, as soon as ever an attempt was made to convert it into a permanent settlement, labour, in the shape of ship loads of slaves imported from a distant source, appeared on the scene. The main reason for this difference in the sequence of development was of course the fact that the climate did not allow of white men being employed at hard manual toil. The Indians, although willing enough to give their services for a limited period in the way I have indicated, were averse, as all wild races are, to anything like steady daily toil, and as the young colony could not venture to quarrel with them, they perforce had to seek supplies further afield, and in addition to all this there was the fact which a very brief trial at permanent settlement brought to light namely, that this colony cannot count upon receiving much help in solving labour difficulties from natural increase of its population. These were the problems which must have presented themselves to Commandeur GROENWEGEL at Kyk-over-al in the early part of 1658, when the first real start at colonisation was made in Essequebo. The question I would ask, is, in what does our position to-day, (1895) differ from that of our Dutch predecessors of 237 years ago? The medical men of to-day are no doubt better informed about the diseases peculiar to tropical climates and the best methods of dealing with them, but they have not learnt enough to tell us how the white labourer may be enabled to work at hard manual toil in the tropics without

utterly breaking down. The Indians still confine their industrial efforts to services identical with or similar in character to those they rendered the earlier colonists. The abolition of slavery has not increased our birth-rate as some of the older abolitionists thought it would, and we supply our labour needs as our predecessors did from a distant source. Where is the difference between 1895 and 1658? There are of course some differences, but none that affect my argument, that in the matter of labour supply we are in the same position as our predecessors; and this, I take it, is a very significant fact, and one which has an added significance, when on continuing to question history, we find that the conditions which have had such wonderful vitality as to survive for 237 years, have been actively at work during all those years, hampering development by holding down the labour supply.

That a want of labour existed during the whole of the slave period we have abundant proof, in the repeated complaints made by the colonists of that day, of the difficulties they experienced in getting a sufficient number of slaves. Sometimes they complained of an actual want of slaves, sometimes that their price was too high, sometimes that the terms of sale were too hard; but although the form of these complaints differed, they all amounted to the same thing, namely, that an obstacle of some kind existed to their getting as many slaves as they wanted. That this was no fancied grievance, but a genuine one, everything goes to prove. We know for instance that by the end of the slave period the trading posts had given place to the three thriving colonies of Essequebo, Demerara, and Berbice, the trading post of

Kyk-over-al having developed into the colony of Essequebo, and ABRAHAM VAN PEERE'S trading post of Fort Nassau, into the colony of Berbice, while the colony of Demerara had grown up by direct settlement, chiefly from Essequebo. All this growth and development of the colonies, meant a corresponding growth and development of the demand for slaves, which growing demand would have given rise to occasional periods of scarcity of labour, even if the business of bringing negroes to Dutch Guiana had been open to every one, but we know this was not the case, but that on the contrary, it was the cherished monopoly of the West India Company which then bore sway in these parts, who discharged their duties as monopolists are apt to do, in a highly unsatisfactory manner. Here, therefore, at the very outset of our inquiry, we come upon facts which point to the conclusion, that the complaints of want of labour were well founded; nor does what has been written above exhaust the evidence in support of such a view. Then, as now, the colonists could expect no assistance in their labour difficulties from natural increase of the population; indeed, it would perhaps be more correct to say, then, less even than now, could the colonists expect assistance from this source, for in the greater number of the West Indian Colonies during the early part of the slave period the population did not only not increase naturally, but it showed a decided tendency to dwindle, being only prevented from dying out by the fresh arrivals from Africa which then came more or less regularly to hand. Later on, however, when the slave trade had been abolished and the tendency to decrease, being no longer concealed by fresh importations, showed it-

self to its full extent, the fact that such a tendency existed was greedily seized on by the extreme section among the abolitionists, who pointed to it as proof of the brutality of the system of slavery in force in these colonies, their view being that the barbarity of the system was such, that the unfortunate slaves dwindled away under it. Now this was a grave charge to bring, and as even slave owners have feelings, one would expect that some rebuttal of the charge would be attempted by the colonists. Accordingly we find that they explained the tendency to decrease, by pointing out that adults for the most part were imported, and children but rarely, a state of affairs which must have given rise to a high death-rate, since each adult, being well on in years on arrival, spent only a part of his life in the West Indies, while on the other hand the small number of women imported in proportion to men,—the usual ratio being three men to two women—combined with the gross immorality which prevailed among the blacks, operated to keep down the birth-rate.* There was also a strong tendency among the slave women to practise abortion, which must have exerted a powerful influence in the same direction, the origin and cause of which is explained by the author of a work on "The Management of Negro Slaves"† by the suggestion that there was no inducement for slave women to produce children who would be doomed like themselves, to a life of servitude, and who would aggravate by their claims for maternal support, the evils of their mothers' lives. All these arguments explain satisfactorily the decrease

* "Barclay's West Indies," London, 1826.

† "Management of Negro Slaves," London, 1803.

in the population noted by the abolitionists, without resort to their theory that it was occasioned by the brutality of the system under which the people lived. But, there was a shorter method of meeting and disposing of their charge, namely, by denying that there was any decrease, and as the colonists did not adopt this method in spite of its simplicity, we are forced to believe that it was because they could not do so. The fact that the population dwindled would therefore seem to rest on the direct evidence of the abolitionists, and on the indirect evidence of the colonists, and since such bitter opponents practically agree, the decrease may therefore be taken as established. Now if this be true of the West Indies generally, in many parts of which the tendency to dwindle has quite disappeared, it follows that it must in a greater degree be true of British Guiana, where such a tendency still exists in spite of the improved conditions of to-day. To sum up then, we have the fact, that during a period when in face of all drawbacks the colonies were making considerable progress, the want of a local supply of labour, such as exists at the "Cape," forced the colonists to import supplies from outside, that the disadvantages arising from this step, thus forced on them, were aggravated by the business being in the hands of monopolists, and that their labour difficulties were further intensified by causes not under the control of the colonists, which tended to increase the death-rate, and decrease the birth-rate. All of which facts go to prove that during the slave period, the want of labour must have been felt, and once more, that the colonists' complaints were well founded. What was achieved with the labour they had, besides shewing the soundness of the principle of bringing

people into the country from outside, shews also that with a better labour supply, they could have made even greater progress.

We now come to the greatest event in the labour history of the colony, viz., the Emancipation. British Guiana began its existence as a Dutch possession, but it fell under English rule (1796 and 1803), in ample time to go through the labour and other troubles which were the first effects of the abolition of the slave trade, and of the Emancipation. The reason why Emancipation produced such a serious effect on the labour market, was that it caused a labour famine, such as might have occurred, if the population had suddenly been reduced by 50 or 60 per cent.; by substituting for the strict discipline of the slave period, the freedom from all restraint of the new regime. By the slaves being free, was interpreted to mean that they need not work any more, and as tropical conditions impose no very severe penalties on the idle, such as quickly overtake them in countries where labour is abundant and where there is a winter to face, they (the freedmen) were able to persist in their views of the privileges of freedom, until a very considerable number of properties had been abandoned. This was foreseen by the colonists, who suggested that some well considered scheme of Immigration would be necessary to maintain cultivation when freedom was given. The Abolitionists however would not hear of it, but roundly asserted that the labour of a free peasantry would be much more effective than the forced labour of the same men working as slaves. This might be the correct view to take as regards those peasants who do work, but what becomes of the theory when the peasants happen to be inde-

pendent and can idle if they wish, while the amount of work to be done requires the full strength of the old gangs? The answer to this question, British Guiana was destined to work out in a practical way, and a dire experience it was. The situation however brought its own cure; the work which the negroes refused to do went on shrinking as abandonment proceeded, until it became an amount so small that even "Quash" had to bestir himself, and the colony finally settled down to a lengthened period of stagnation. Growth or development there could be none; that was strictly limited by the existing labour supply—but provided the white colonists, who still stood by the colony, were willing to vegetate and attempt nothing in the way of progress, the black man was powerless to work further evil. This state of things lasted, until as the result of many trials, the present scheme of East Indian Immigration was started.

Before proceeding however to tell how the colony was lifted out of this "Slough of Despond" by Immigration, it is necessary to trace the part played in the Emancipation troubles by what I have termed the permanent causes of labour difficulties in British Guiana. The reader will remember, that these causes as enumerated by me in the earlier part of this article were:—

1st. The absence of all available local supply of labour.

2nd. The inability of white men to work at hard manual toil in this climate, without utterly breaking down.

3rd. The consequent necessity for the importation of coloured labour.

4th. The absence of natural increase of the population.

It is simply necessary to mention these causes, and it is at once evident that they must have been very powerful factors in intensifying the troubles of that time. Suppose for instance causes 1 and 2 to have been non-existent, that is to say, suppose that the colony had possessed an available local supply of labour, and that it had also possessed a climate which allowed of the introduction of white labour, it is evident that not a single black man would under those circumstances have been brought into this country as a slave, and it is quite possible that we should have had no slavery, and consequently no Emancipation crisis to face; for it is certain that white labour would not have been enslaved, and the same policy which prevented our Dutch predecessors from making slaves of the Indians in the immediate vicinity of their colonies, would probably have operated to prevent the enslavement of the local labour. Or again, suppose cause 4 to be one which was non-existent, from the example of Barbados and other colonies, where the population increases naturally, we know, that under such circumstances our want of labour would have become gradually less and less as years went on, until it finally disappeared, and since a tendency to natural increase would have operated to a certain extent during the later slavery period, we should probably have begun the new regime under more favourable conditions as to labour supply. It would therefore seem that the great crisis which followed Emancipation drew its chief power to harm from the same causes which we have previously found operating so powerfully to retard the progress of the colony on other occasions.

To return to the condition of the colony after Eman-

cipation. I have described the situation as a sort of dead-lock, which allowed of the maintenance of the existing state of things, only on condition that no forward movement were attempted. To appreciate the lesson that this portion of the history of the colony teaches, it is necessary that this fact should be emphasized, I therefore make no apology for returning to the point, and fortunately I am able to adduce the evidence of a still living witness, as to the exact state of affairs. My father arrived in the colony at the close of the period of stagnation. The first big crash was long over, and things had settled down, but occasionally an estate would drop out of cultivation, unable to bear up under the pressure of the times. Of those that remained a very considerable number seem to have been in the hands of the large mercantile firms, and although there were a few so favourably situated that they could shew a profit on the the year's working, the majority shewed none at all. Those in the hands of the merchants were simply run as customers for the stores their ships brought out, and to supply return cargoes for the same. Two stories which my father tells are strongly illustrative of the state of affairs which existed. The first shews how estates were worked, not as recognised profit-earning concerns, but in the supposed interest of their Water Street owners; the second, how absolutely crops were controlled by the limitations of the labour market.

Story number one, is of a young planter appointed to his first management. The estate bore a bad name as one that did not pay, and of course the newly-appointed manager took it over with the determination to alter this.

It was customary in those days to send down from the estate at the beginning of the year, a requisition for the stores likely to be needed during the year, and our young friend had to do this shortly after he went on the estate. On going into the matter he was greatly shocked to find that the orders sent in previously had been as he thought needlessly full, and he went carefully over the last year's list and made his requisition less by about £100. This he took up to the Attorney, who promptly returned it to him with instructions to send in the customary order, explaining to him at the same time, that his proper province was with the agricultural part of the estate's work. The story does not say, but doubtless our young friend came in time to see how necessary it was to the successful conduct of a shipping business, that vessels should have full cargoes both ways, and "his early bad manner," as they say of the painters, was dropped as he gained experience.

The other story is of a man who had taken up an estate which was not paying and had contrived to make it pay; he must have increased the crop, and forgotten to increase the requisition for stores, or made some other mistake of that kind, but however that may have been, his position was what I have stated it to be—he was on an estate which was paying. Human nature is much the same in all ages, so it need occasion no surprise that the absentee proprietors, for whom he was working, sent out to know if he could increase his crop by say 80 hhds. He wrote them in reply, that the crop he was raising, was one which the labour he had at command allowed of his raising easily; it represented in short the industrial effort which the labour in his district was willing to make

without the bribe of higher wages; 80 hhds. more, he could grow, but not only must they expect an increased expenditure, but they must be prepared for the reduction of the clearance he had hitherto given them. In conclusion he suggested that if they wanted 80 hhds. of sugar for any special purpose, it would be cheaper to purchase it in London or Liverpool at current rates than to try to grow it for themselves. He did not receive instructions to extend cultivation.

Such was the state of the community into which the East Indian Immigrant was introduced, and which he was destined to revolutionise. It must not be supposed that "Sammy" secured immediate recognition however, on the contrary, one uncomplimentary estimate of him that I have come across states that "one good black shovelman was equal to three coolie shovelmen." That he found someone to believe in him however is evident, for he continued to be brought to this country, and as his numbers increased he made his influence felt by causing a fall in wages, and restoring once more the power of control to those who found the cash. In bringing about this, from the Capitalists' point of view, happy result, he was considerably aided by the great drought which began some time about the end of July or the beginning of August 1845, and lasted, with but a slight break at Christmas, down to the middle of May 1846. Such a drought always produces a scarcity of agricultural work; for one thing, there is no grass weeding to do, and then towards the close the ground becomes too hard for even tillage operations to be carried on. Such a state of affairs leads to a fall in wages, but the rains, when they do come, usually produce a recovery, and the hard times

for the labouring man pass away. In 1846, this was not the case. The wages exacted by the black man in his hour of triumph had been so high that they could not be maintained when the employer felt his turn had come. So wages fell, and sugar estates began once more to be recognised as profit-earning concerns. The new labour supply was at first used to increase cultivation, which could now be done without sacrificing profits, but with the return of confidence owners did not long rest content with merely enlarging their estates. At first a few proprietors put up Vacuum Pans with a view to turning out a superior sugar; when these proved successful, numerous others followed suit, and the colony entered on a period of great prosperity, in which all classes shared. Wages, which fell when Coolies were first brought to the colony, now rose again in consequence of the new-born confidence in sugar property, ths result of the improved labour supply. Of this improvement, the blacks among the labouring classes, secured the lion's share, for they supplied the carpenters, masons, blacksmiths, coppersmiths, engineers, painters, sicknurses, and panboilers, for which there was an increasing demand in the new era of prosperity. Even those among them who remained agricultural labourers came in for a share of the rise in wages, for while it took something to get up a large immigrant gang, the black man was on the spot, and could always be bribed to a little extra exertion by an offer of higher wages; so that when it came to be generally realised that so many hhds. of the famous yellow crystals meant so much revenue, plenty of proprietors were found willing to sacrifice a portion of their profit, in order that they might se-

cure an increase of their crop, and therefore of their revenue.

During the whole of this period, we hear little or nothing of labour difficulties, and the four causes of labour scarcity, to which I have previously directed attention in this article, appeared to be inoperative. The establishment of an Immigration scheme, which satisfied the labour needs of the time, seemed to have deprived them of all power to harm, and the annual charge for Immigration which appeared in the books of the plantations and in the Colonial Budget were the only indications that such causes existed.

We have seen the colony as a young community wanting labour, supply itself with slaves from Africa, and whatever may be said about slavery as a system, we have seen that this compulsory Immigration, if I may call it so, resulted in considerable development. We have seen slavery as a system abolished, with the result that the gangs which under the strict discipline of the slave period had proved quite sufficient for the industrial needs of the country, no longer sufficed, and that the country retrograded considerably in consequence. From this condition it was rescued by a fresh introduction of labour from outside, on a system more in accordance with the ideas of the age, and with this renewal of Immigration we have seen prosperity return. I have now to relate how, when a second Industry was started in the colony, and competed with the sugar planters for the local labour, a considerable labour famine arose, and a crisis, second only to that of the Emancipation, was the result, shewing that if the permanent causes of labour scarcity in this colony can

be put to sleep by small Immigration schemes, they can only be eradicated by dealing with the question on a much more liberal scale than has hitherto been attempted.

To begin at the beginning, I must remind my readers that two-thirds of the cost of the East Indian Immigration, which as we have seen was beneficial to the colony as a whole, was paid by one class, the planters. This had the effect of making the labour supply of the country dependent on the prosperity of a single class of the community. Granted that planters were successful, and saw their way clear to usefully employ more labour, they brought it in and the colony throve; on the other hand if sugar growing was in a depressed condition, the planter curtailed his indents and things all round were dull. No really strong effort was made to tap other sources of labour supply than India. The public having asserted that the planters were the class chiefly interested in Immigration, made them pay the cost of it; they then followed up that strange theory by the perfectly logical deduction, that as the planters paid the piper, they had a right to choose the tune. Accordingly, when they (the planters) declared the coolie immigrants to be suited to their needs, the Immigration Department was allowed to crystallize into an "East Indian Immigration Department." Now, whatever may be the virtues of Sammy from the planter's point of view, it is indisputable, that in his raw state, he is not much of an acquisition even on a Sugar plantation, and he is perfectly useless anywhere else. Employers of labour in the bush cannot avail themselves of his services, because even if he could survive bush life, which is improbable, the gold-

diggers are unable to carry out the multitudinous provisions of the Immigration Ordinance, and a like inability to conform to the Ordinance would operate in the case of small employers also. The position created therefore was this, the immigration scheme, because at first the public thought it could only benefit Sugar growers, was allowed to become what they thought it, namely, a means of supplying labour to the estates, and there was practically no provision made for any other industry that might grow up in the future, requiring other labour than East Indian. Accordingly, all new industries on starting, found themselves forced to fight for a share of the limited supply of local labour, with the established industry, Sugar; powerless to procure other labour from outside, they were forced to draw on this supply, and to do it had to outbid the Sugar growers. With sugar at from 26/ to 30/, the issue of such a struggle was a foregone conclusion. The new industries either never got beyond the talking stage, or else they succumbed after a brief struggle. In process of time, people came to recognise that the result of most attempts to start a rival industry to Sugar, ended in a failure, and not recognising the cause, many otherwise charitably disposed folk in this colony grew to have a very bad opinion of planters, who they supposed cherished bitter hatred to every industry but their own. As I have shewn, this was not so. Sugar killed all opposing industries, because the effect of the legislation which saddled planters with what ought to have been a public charge, was to produce a state of affairs, which forced every new industry when started, to compete with them for a share of local labour. Planters can scarcely be blamed, the conditions being

what they were, that they considered their own welfare.

This state of affairs which I have briefly outlined, continued down to the time of the starting of the Gold Industry. The planters paid their two-thirds of the cost of Immigration, and enjoyed a virtual monopoly of the labour of the colony. Here let me again state, that it was not that they took any active steps to bring about this result, but simply, that the only competitors with them for a share of the local labour, that could arise, were possible new industries. The only condition on which such industries could secure a share of the labour was to outbid the planter; and as plantation wages in the flush times were not easily outbid, as a matter of fact, no new industries arose. It is a significant fact, and one that goes to prove the correctness of my description of the industrial situation prior to the gold era, that 1884, the year from which the gold industry dates, is also the year in which the first of those heavy falls in sugar took place, with which planters have become so terribly familiar of late years. There is no denying however that whatever assistance the founders of the gold industry may have received from the fall in sugar, they deserve the highest credit for their thorough appreciation of the conditions under which the new industry was to be founded. They seemed to have seen clearly where they were to seek their labour, and to have understood thoroughly the means they must employ to secure it. The wages they offered, 64c. per day and food, were considerably higher than what planters were paying at the time, and constituted a ringing challenge to the industry in possession. High as these wages were, they

worked out in practice higher still, for when the gold field labourer reached the placer, 64c. per day in many cases, became 64c. per task, and men of powerful physique could do two or more tasks in a day, proportionately augmenting their wages.

For several years after the starting of the gold industry, it produced scarcely any effect on the labour market. There were good reasons for this. First, the new industry required time to grow; and again, the colony had not been importing coolies for years without effect. Immigration had created a certain accumulated stock of labour in the country, and the first requisitions of the new industry were easily met out of this stock.

It is difficult to state exactly when the first effects of the competition of the new industry began to be seriously felt by the planters, the truth being, that the time differed in different localities. I think however that it will be generally conceded that towards the close of 1891 every sugar district in the country was brought face to face with the coming trouble. Fortunately or unfortunately, as the sympathies of the reader incline, the close of the year 1891, ushered in fresh troubles for the planter. First, the close of that year saw another of those heavy falls in the price of produce, one of which I have already noted, and which, by preventing planters from paying high wages, no doubt helped to break up the old state of affairs, under which new industries had fared so badly. In the next place, the greater wet season of that year, had partially failed, while the lesser season was late in beginning, which gave rise to a drought of great severity. On December 3rd, the wet season set in with great violence, and in

the short space of ten or twelve days, planters were suffering as severely from excessive wet, as they had previously suffered from the reverse condition. Nor was this all, the end of the year wet season was prolonged until it joined that of May and June of the following year, and the resulting unbroken period of rainy weather, by augmenting the demands of the planters on the labour market, tended to increase the existing shortage of labourers. Wages of course rose heavily, and this too when planters were called on to submit to serious reductions in the price of their produce. Truly the old industry had fallen on evil days.

Towards the close of 1891, just before the labour trouble entered on its acute stage, there was quite a rush of sugar estates into the Administrator General's hands; Georgetown, in sympathy with these country failures, had a small crop of failures of its own, and then things settled down a little. The first crop of failures had consisted of the weaker members of the community, in a financial sense; those who remained, took more killing, but they continued to drop out in the years of crisis which followed. The situation was not unlike the Emancipation crisis, of course on a smaller scale, there was the first big crash to usher in the crisis, followed by the long drawn out misery of slowly approaching ruin. In one respect however it differed from the period with which I have compared it. In the troubles that grew out of the Emancipation the whole of the propertied classes of the country recognised that they were interested; but in 1891, in spite of the grave crisis, and of individual failures, the general public maintained a Galliolike attitude, and "cared for none of these things."

They were rich in imagination with the gold they were going to find. A planter told me that during the height of the labour crisis, being in town he happened to call at the Tower Hotel. A party of young fellows came in and ordered drinks. While waiting for their liquid refreshment, one of the number by way of profitably passing the time, started a conversation with the remark, "now that the sugar industry is played out the colony will have to depend on gold and diamonds." The conversation thus started, rippled pleasantly along, on a gold and diamond basis. None of the party disputed the fact that the sugar industry was played out, none of them appeared to recognise that if it was in a bad way, that one of the causes at work to make it so was the weather, which could not remain unfavourable forever, and that another was the labour difficulty which it was quite possible to remove, but more extraordinary still, none of them appeared to recognise that the failure of the sugar industry was a matter of any interest to them. The value of the products exported by the sugar industry, amounted then, if they do not now, to from 70 to 75 per cent. of the total exports of the colony, but these young gentlemen supposed they could afford to look on as spectators of the ruin of an industry which thus supplied the bulk of the exports. It may seem a hard thing to say, but it is perfectly true, that their opinions were a fair sample of the opinions held by the general public. Not that I mean to say that men who thought the matter out, deliberately reached the conclusion that the colony could do without sugar, but that the majority, who did not think, held that opinion. If asked for their views on the future of the country, they replied somewhat as follows:

"Look here! this country has plenty of gold, what we have to do is to prove this to capitalists on the other side of the water; that once done, capital will flow in, and if we can get capital, labour will follow." If one protested as to the vagueness of the statement, labour will follow, and asked for more light, you were told, yet more vaguely, "look at California and Australia." This advice I took, I was deeply interested in sugar, and although I did not believe that sugar was "played out," yet I did think that it stood a very fair chance of being stamped out, if the adverse conditions with which it was struggling only continued long enough. Unlike the young gentlemen in the Tower Hotel, I recognised, that reducing the exports by 70 per cent., was likely to lead to a crisis that would break the colony's record in that particular class of human trouble. I also looked at the cases of California and Australia, but did not derive much comfort from looking. They were both gold countries, and so was Demerara, and there the resemblance between them and Demerara began and ended. Taking them as typical examples of countries which had been supplied with labour by a gold rush, it seemed to me that Demerara was wanting in everything to produce such a rush, save the bare gold. California and Australia were both countries open to settlement by the vigorous white Northern races, which have been responsible for every gold rush the world has ever seen. In both countries the gold was distributed in rich patches, which allowed of large numbers of diggers working together on a limited area, and this converted Californian and Australian diggings into small compact communities, and allowed of the diggers being catered for by storekeepers who

opened places of business for the sale of supplies at the diggings. Last but not least, their diggings were accessible in a sense in which ours in Demerara are not. However distant the mines might be from the capital in California and Australia, it was always possible for a man to get to them, at the expense of the exertion involved in a long wearying tramp. The majority of the conditions enumerated above, please note, are calculated to favour the poor man, with no other capital than his strength and his pick, pan, and shovel, in other words the men who form a rush.

Let us see to what extent we possess these presumably ideal conditions for development, by means of a gold rush. With us, the mines are situated in dense forests, and can only be reached by pulling in boats up the rivers. The gold, although fairly plentiful, appears to be more evenly distributed, and not to be in patches of exceptional richness, as in California and Australia. This distribution, implying as it does that we have to handle more dirt to get an ounce of gold than they did, is against the poor miner working singly or with a couple of chums, and gives the best chance of success to the capitalist, employing many hands. At first sight these conditions, although unfavourable to small men, and therefore to a rush, seem to favour considerable numbers being settled on a limited area; but this is not so. The fact that the gold is not found in rich patches, tends to cause claims to run large, and so we have a number of widely scattered small groups instead of compact settlements, like the Californian and Australian diggings. This means that each party of diggers has to cater for itself, and carry the supplies it will need, into the

bush with them. The Demerara gold-digger, therefore must be a man possessed of some capital—the more the better—for he has to buy boats, and a stock of provisions, and further, to engage a party of labourers, all of whom require advances when engaged, so that he is considerably out of pocket before he gets any return. So far as we have gone, we have found the conditions under which gold-digging is carried on in this colony, to be entirely different from the conditions which prevailed in the two countries which are usually taken as the finest examples of development by a gold rush. There are yet other matters in which we differ from them however, which I think outweigh all I have already mentioned. I refer to the facts that white men cannot in our climate, work at hard manual toil, and that black and brown men on the other hand, do not usually do much in the way of voluntary emigration. We are in consequence not likely to get a rush of suitable labour, but will have, in this juncture of our affairs, to do as we have done in the past, viz.: import, to supply our wants. The conclusion I reached therefore, as the result of looking at the cases of California and Australia, was that the theory, "if we get capital we will get labour" is as untenable as it is at variance with past experience.

To return once more to the labour crisis of 1891; the blacks and the free coolies behaved all through the crisis, in much the same way that the blacks behaved during the labour famine that followed Emancipation, that is to say, they took full advantage of the necessities of employers, shewing a complete indifference to after consequences—they exacted wages, which were not merely

high, but extortionate. In criticising them however, we must remember that they erred in good company. I have already spoken, of the attitude of indifference of the general public to what was passing around them; the higher Government Officials were quite as bad. Lord GORMANSTON and Sir CHARLES BRUCE are both spoken of as men of great ability, and yet both these gentlemen looked on while the Sugar Industry and the Gold Industry fought fiercely together for the limited supply of local labour, and neither seemed to see that anything out of the common was happening; yet it is most absolutely certain that had the Government made an effort at that time and thrown in a considerable supply of labour over and above the ordinary immigration, it would have much relieved the tension of the situation, and saved thousands of dollars to the colonists.

In the early part of 1894 the labour crisis may be said to have come to an end; things still continued in a bad way, but want of labour was no longer the direct cause of this. The bad times from 1893, on, must be attributed to the losses incurred during the labour famine of the three previous years, and to the further fall in sugar prices which occurred in the end of 1894. As regards the result of the struggle which had taken place, it can be summed up as follows: both industries, Gold and Sugar, had spent thousands of dollars in fighting one another, but while Sugar had nothing to show but losses, the Gold Industry on the contrary, could boast that it had obtained a foothold. The peace that has followed is a peace of exhaustion, and will be broken the moment the general public find themselves in possession of fresh funds with which to gamble. Whether this peace is to be

of long or short duration, it is most acceptable, and comes just in time to save the colony from a great calamity. Had the gold boom continued through 1894, and had the weather been the same as during the three previous years, planters would have been called on to face the last heavy drop in sugar without possessing any power to control wages. This they could not have done, and if it had been attempted, it would have resulted in a crash in sugar, which would have inflicted bitter losses on the whole community.

The question is, what are we going to do? We have escaped the danger that threatened in 1894, but the causes which gave rise to it are still in existence. The bulk of the labour introduced into the country by the Immigration Department still consists of East Indian Immigrants, who, perfectly suited to the planter, are but little suited to the rest of the community, and not at all to the gold people. If the Gold Industry is to develop therefore, it can only do so with labour wrested from the rival industry, and as Sugar can be relied on to make a fight for it, this means that any renewal of a tendency to expansion on the part of the Gold Industry, will be a signal for the renewal of the struggle between Gold and Sugar. Heavily handicapped as it is by the present condition of the Market, Sugar will I suppose in the long run be beaten. But, while the struggle lasts, what becomes of the colony's chance of expansion, and when Sugar is beaten, how is the colony bettered? If there be no attempt made to increase the labour supply, Gold will simply step into the place which Sugar has vacated, and as long as it is able to outbid other industries, it will maintain its position by killing all rivals, the moment their demands on

the labour market grow inconveniently large. This will not be because the gold people have inherited with the planter's position the suppositious planter vice of jealousy of other industries, but because their then position, like the planter's present one, will admit of no compromise; they will have either to kill or be killed.

Again I ask, what are we going to do? To me, it seems that we have reached a point in the colony's history, when we must be prepared to start free immigration. There is to my mind no other way. As long as there was practically only one industry in the country, it was quite possible to make it pay the bulk of the cost of any immigration scheme. The Sugar industry had no alternative but to accept immigration at any price, or stagnate and die. The case of the gold people is different; they have an alternative course, and need not pay for immigrants, even if they were provided with them, unless they feel assured that such a course will pay them better than fighting the planters for the local labour. Now, although there is no doubt that immigration pays in the long run, it cannot be said to do so at the start. One has to pay for one's immigrants, teach them their work, and also give them current rates of wages, however high those rates may be. It is only when continued immigration has affected rates, and given control to employers, that they begin to experience the advantage of it. To look forward to such a result however, is to take a long view, and the present is no time for taking long views in the British West Indies; there is little doubt therefore that the gold people, if presented with the alternatives, either to pay Immigration Fees or fight the planters, would with all the odds in their favour, elect

to do the latter. Since more labour is necessary for the development of the country, and legislation to compel any one class to use imported labour, if they do not choose to do so, is out of the question, it would, I submit, be the best way out of the difficulty, to recognise the importance of immigration to the colony at large, and supply all industries with free labour.

The great difficulty to be encountered in doing this, would I believe, be that of finding suitable immigrants for the various industries. The planters have already had this problem solved for them, and free East Indian immigrants would give them all that they could ask for, and even more than many of them expect. But when we come to the case of the Gold Industry, no such easy solution awaits us. The ideal labourer for the gold bush, would, I take it, be a man possessed of considerable physical strength, and who was also malaria proof. Africa, that old recruiting ground for West Indian labour, seems to be the most likely place to find such a man, if he exists; but the question is one which could only be settled after careful inquiry on the spot, possibly, only after actual experiment. Now, such inquiry and experiment would take time, and doubtless, as was the case before the Coolie was hit upon, there would be mistakes and disappointments. It is in surmounting these preliminary troubles, that in my opinion, the chief difficulties in starting a scheme of free immigration would lie.

Many I suppose will be inclined to think that the money difficulty will be greater, but I do not think so. In a country like British Guiana, where most things are taxed, it is impossible for a man to come into the country and avoid contributing to the revenue, if he only feeds

and clothes himself; while if he is hard working, his industrial activities will give rise to other demands, the satisfying of which will further augment the revenue. This being true of one man, is true to a greater extent of a considerable number of immigrants. Let us take a case ot say, 7,000 Coolies introduced in one year by planters. They are distributed among different estates, and the effect of their introduction on the trade of the country and consequently on its revenue, is considered to be insignificant, because there is no opportunity of judging of it as a whole. Let us attempt to get a rough idea of it. Consider the number of cottages that would have to be built to accommodate 7,000 persons, and the consequent demand for building materials and skilled labour which would result, then estimate the value in tons of sugar resulting from the industrial activities of that number of people, say 7,000 tons of sugar, consider also the demand for skilled labour and supplies which would be created by the manufacture of such an amount of sugar, why, it would amount to rather more than the addition of another Plantation *Diamond*, to the colony. Add to all this, the business resulting from the satisfying by 7000 people of their personal wants, and you have some idea of the effect on the trade, and consequently on the revenue of the colony, of such an importation. Remember too that these demands, with the exception of that for cottages, would continue for the ten years these people remained in the colony. I would now ask if it is not very probable that "Sammy" has usually more than repaid the cost of his importation, when he finally takes passage on the return Coolie ship for his native land. To those who are still sceptical as to immigrants judiciously in-

troduced paying the expenses of their introduction, I would cite the case of our system of Coolie Immigration, which as I have shown, lifted the colony out of a state of depression into a condition of great prosperity. Who but the community as a whole paid the cost of this? It is true that the general community paid only one-third, and a particular section paid two-thirds, but it can scarcely be argued that this unequal distribution made the burden of the cost easier to bear. Its effect was quite the reverse, I should imagine. If there are any however who refuse to be convinced that the colony as a whole, is able to pay for the labour its industries need, I would ask them to remember that this is a country which—

1. Possesses no local supply of labour in excess of its present needs.

2. The population of which does not increase naturally.

3. Which cannot expect to be settled by European emigrants.

4. Must therefore import its labour.

If they really believe it to be incapable of paying the cost of such importation let them follow their opinion to its logical conclusion, and say that the colony is incapable of development without an increase of the labour supply. In 1891, 1892, and 1893, we travelled quite far enough along that road to enable us to see that although it starts broad and smooth, it narrows as one proceeds, to a track which will only allow room for one industry. Now, we have given the single industry idea a fair trial, and it has in the end failed us. The British Guiana therefore of the future,—the British

Guiana which we are all hoping for,—is no single industry colony. It is a colony with many and varied industries, the more the better,—and our best chance of attaining our hopes, lies in the adoption of the principle, "free immigrants for all industries." Here are two paths; to take one, will require courage, and at the outset some pecuniary sacrifices; the other we can take without trouble or expense. They lead in very different directions. Once more I ask, "what are we going to do?" The answer is for the public to give.

Education.

By an Old School Manager.

THE narrow limits of school work usually understood by the term education are by no means those within which the subject is to be treated in this paper. The school system now in vogue in the primary schools of this colony will be discussed, but the reader, more particularly if he be a member of the Society whose proceedings this *Journal* is the record, is requested to look up the term "Education" and keep the widest conception of it in mind while reading these pages. The foolish idea of education being the mere cramming of people—young children mostly—with certain information in order that they may pass certain examinations, is supposed to have passed away. Has it? I think not. The fact that teachers in primary schools are paid by results; that our scholarships are given to the mere getter-of-marks; that a large sum of money is given to a man as a school teacher—albeit he may be utterly unable to teach—provided he has passed a certain examination, to test, not, mark you, his capacity and power to teach, but his possession of certain knowledge; these facts I repeat disprove it. The old tradition still obtains. Hence the necessity for keeping in mind a clear conception of what education is. Draw out, expand, develop, and train; these are the ideas we want made into facts. Everywhere the putting in, the adding, the cramming and plastering has had full sway for the last fifty years, and hence we have servants who have

passed the VI and VII Standard, and yet can neither write an intelligent letter in grammatical sequence, nor trim a duplex, or kitchen lamp; carpenters who cannot even sharpen their tools properly much less turn out finished work; and what is infinitely more to be deplored, don't want to. They are eminently satisfied with themselves. The mistress grumbles at the maid, and the master swears at the man, but maid and man get accustomed to this, while mistress and master find the average educated capacity so low that what is, is patiently or impatiently, but nevertheless, borne as though it were past remedy.

Here may the Royal Agricultural and Commercial Society step in without intrusion.

Now let us enquire what we are doing for the children and young people growing up among us in respect to:

First, general knowledge, as given in primary schools, and

Second, technical knowledge, imparted usually to young people during apprenticeship?

The Government pay a little over one hundred thousand dollars per annum, to aid a number of benevolent persons, who possess schools, in what they deem—who can say we cannot and do not joke after this—educating the rising generation. Certain stipulations framed seemingly with a view to setting "these benevolent persons" and their employees by the ears have to be observed by all parties. These are termed The Code of Regulations, &c., and by them the portion of the money paid by the Government is restricted to so much *per

This is worked out in conjunction with the average attendance, but it comes to the same thing in the end.

head for each child that is able to satisfy the Inspector of Schools that he possesses a certain modicum of the three R's. The teachers moreover are absolutely dependent for their stipends upon this Government payment. The benevolent persons who own the schools are usually poor either in pocket or disposition, and always pay the teacher by the results. The chief actors in this drama—farce it may seem now; but it will be tragedy ere long I fear—called Managers of Schools, are Stipendiaries themselves and quite unable to employ a teacher as it is to be presumed they would wish, that is to say, at so much per annum. In this 'code' the three principal items are those just mentioned, but there is also a provision for an increased grant for schools, where the children pass in English grammar, geography, and sewing. The owners of schools being mostly clergymen, religion is left to them, as also are a few other things that go somewhat further than the three R's to make loyal and desirable citizens, such as discipline, cleanliness, industry, regularity, and punctuality. The very obvious outcome of this arrangement is that everybody is dissatisfied, the on-looker, who also looks ahead, most of all. Paradoxes are all very well in their own way, and "who wishes to get good coffee out of the pot, must put good coffee in;" but a human being is something more than a coffee-pot. Nature has already endowed him with potentialities the transmuting of which into actualities we term education. In the process, as in starting a pump, some of the element you desire to extract must first be poured in, but a system of nothing but pouring in obviously is mis-called *education*. Many teachers regard their work as if it were loading vessels for a year, to be

unloaded on the day of inspection. And, how complete this unloading is, let any one examine a boy or girl who has left school a year or two, to find out. If he does not already know it will be a revelation to him. But taken even upon its merits, not as a developing of capacity, but as a mere repository of elementary knowledge and art, the product of the present system is *not* a success. Despite her having passed the V Standard, poor MINERVA ANGELINA has to plant out in little sums the separate amount for each item, the money she has to spend in the market for her household wants. Three pence may be the sum total of nine oranges at three a penny, but simple as it is, MINERVA, because she has been taught 'to do sums' to satisfy the Inspector, instead of having her calculating talents educated, is much more satisfied that three pence is the right sum after she has put them out into "penny parcels." This is a simple instance, but although decided, not unfair, because I am speaking of the average and not of the geniuses or duffers. In respect to the moral fibre of the 'educational' out-put, but that it must be discussed, the less said the better. As anyone may observe who cares to read the Education Ordinance, the Government take no account of it. They make other provisions for it, a provision costing a good deal of money too.

I am aware that a time—termed time for religious instruction—is set apart in Government Primary Schools. Some clergymen take advantage of this and either personally *educate* the children in morals as they understand the word, or see that the untrained teacher does so. The Government, as far as I can learn, have little control over the clergy in 'the service,' with the usual result that

each does what he deems his duty or suits his inclinations in this connection. A Government paid clergyman may visit the schools of which he is the manager every day or once a quarter. Whether even the loading process goes on in respect to religious knowledge we do not know, as there is no examination or report ever put before the public. We all probably know clergymen who have a deep sense of their responsibility in this connection and heads sufficiently clear to appreciate the value of the school as a nursery for the church, and possibly we also know men who look upon school work of any sort as an irksome necessity. Whoever may be in fault there is certainly a very conspicuous lack of moral vertebræ also in the out-put of our primary schools. But in saying this it must be understood that I am speaking in the positive degree only. Whether there be as some say progression, or as others think retrogression, I haven't sufficient evidence before me to enable me to judge. Probably every one but partizans will admit that the present system of Primary Education belies its name, is cumbrous, and very expensive. To crown all it is wofully defective in the fact that it makes no provision for the efficient training of teachers.

After the Primary School course particularly, Education should become technical, but here, through no fault of anybody positively, and everybody, Government included, negatively, the want of powers educated in respect to their calling marks the great majority. No encouragement on the one hand or restrictions on the other of such trade guilds, or unions, as are found elsewhere, exist here to induce the learner to submit to discipline and small pay in order to learn his trade

properly. Possibly, with a less light-hearted, live-for-the-day-only, kind of people, the prospect of future advantage would induce the adolescent to submit to have their powers instructed and educated; thus in the end properly restoring tbe balance and placing the best men at the top.

"Sufficient for the day" is the popular motto in the colony, and the average young person has no more doubt, if another gets on better than he, that it is solely and simply through interest, than he doubts to-morrow will follow to-day. Perhaps in this respect he is a better judge than I am—having more experience. If it be so, then the more important it is that some action should be taken to dis-illusion him in respect to our ultimate fate as a Colony. The ignorance and uneducated talent our artizans may possess is not to be observed in one trade merely, but in all trades. The maid's conception of household fixtures, and furniture, to say nothing of food and culinary matters, is a marvel to weep over. It is so commonplace a fact, that it would be superfluous to state it were this Journal not read outside the colony.

The boy and girl attend school a number of years, pass certain standards, and then as opportunity offers, leaves school to go to work, in the case of boys, and go to service or help at home, in the case of girls; but difference of age being allowed for, they are no more intellectually developed or educated than the urchins who run the streets. From school to work is a step further in the same direction, except that instead of the examiner there is now the employer "to pass." Life sinks to a sad level of idleness or drudgery, and the supreme reward

of the intelligent workman, the poetry of life, is lost, to be replaced by the sordid satisfaction of pay.

If you, reader, can do anything really well, contemplate the satisfaction the task masterly done gives you, and compare that with the incident of pay, and you will know what the creole loses and what he gains.

Here then surely the Royal Agricultural and Commercial Society can step in.

Agriculture is despised in a land of agriculturists. How is this?

Slavery, you say.

Very well, be it so.

But how will you remedy it? Exhibitions are good but they must not be always in the city. We want parochial flower and garden shows. You can manage *them* surely. But even then little will be done unless a constant effort is maintained and the people reached through the children. As a matter of fact no power will ever remove the repulsion the present manhood of the colony feels for agriculture, but we may entirely remove it from the rising generation by attacking it in the schools. I need not say just how, but if the influence of this Society is merely thrown into the scale on the right side every school in the colony may become an industrial school ere a year passes by. Five hours a day are spent in school; of these one is enough for religious instruction, two and a half for book work, and one and a half for industrial training; preferably, but not necessarily agricultural.

If the Society asks it the public will give its support to enable them to assist now and then in some material way. There are men of undoubted ability, to say nothing

of the Curator of the Museum, who could give addresses and lectures on things pertaining to the science of agriculture were the arrangements made and out-of-pocket expenses paid by the Society.

It is futile to say the education of the rising generation is no concern of an Agricultural and Commercial Society. Agriculture looms larger ahead of the creole every day. Numbers of so-called mechanics have already been driven back to their farms; and the farm is destined to be the salvation of vast numbers more. At no time has such an opportunity been presented of doing something in this direction as now. Hard, every day facts and experiences are making for the ends we desire, and the "tide taken at the flood" will surely in this as in most other cases lead to the desired end. There is nothing so easy as leading people where they *want* to go, and now that larger numbers are turning their eyes towards their farms the intelligence and influence of this Society might vindicate its existence in some really great manner such as I suggest.

At first of course facts must be obtained,—information and opinions of all sorts gathered and tabulated—the result of which will possibly be that the Society will be able to approach the Government and suggest an industrial school system which should

First, cost not more than the present system.

Second, really *educate*.

But to do this,—and here the real difficulty will be felt,—it will probably be necessary to urge upon the Government, the need for making better use of the Agents they already employ in this connection. As a model upon which to go, the Medical Department may

be suggested. Every doctor has his definite duties to perform in connection with his assistants, the sick-nurses at the hospitals. His visits are regulated as to time, and his duty when making his visits well defined as to procedure, etc. Almost every other department is also conducted upon some well defined system, with the exception of the ecclesiastical department. In this each individual is apparently left to his own sweet will. Yet this is a body of intelligent well-trained men. Some have come to their work stamped with academical hall-marks of varying repute, and others have distinguished themselves as men of parts since they came to their work, Can nothing be done with this great well-trained body of men to solve the education question?

Another necessity will probably be the reduction of the number of schools. In many places there are three or four schools where one would suffice. At A, an "English" school may be seen; at B, a quarter of a mile further on, a "Scotch"; at C, a mile away, a "Missionary" school, and so on. At each of these schools a teacher is in charge who draws something between ninety-six and two hundred and forty dollars per annum, upon his certificate merely; and who could as easily teach the children of the three or four schools as those of his own.

The ecclesiastics, some may urge, will object and fight for denominationalism; very well then, as Sir HENRY IRVING suggested, the money paid to the Ecclesiastical Department may very properly be diverted to a *better* purpose than bolstering a number of denominational systems.

In any case, seeing that this is an Agricultural Colony,

that the children to be educated are to be agriculturists, and that this Society's title is "Agricultural," a very good case is made out I submit for its active and direct interference in this vital question now happily re-opened by the action of the Education Department itself.

The next question is how to encourage the young people to submit to the discipline of apprenticeship.

In the first place try to give them some really efficient protection. Take away from a man who has not served an apprenticeship, the power to sue for work done at his 'calling.' It will be up-hill work where all are quacks to establish the legitimate order. But there is no time like the present. A small bonus too might be given to every apprentice when he comes "out of his time."

At certain centres technical night-schools might be encouraged, and lastly the Society might have some short but well written Tracts upon these and kindred subjects distributed among the people.

They might be called the "Eye-opener Series"; and treat of common-place subjects and objects which form the every day environment of the peasant in the West Indies.

The peasantry of the Colony are a fine people in respect to their potentialities, and now that such a large admixture of East Indian blood has been permanently introduced, the real education of the masses is a work worthy of all we can bestow upon it.

The Old Boundary of Essequebo.

By the Editor.

IN view of the fact that Venezuela lays claim to the whole of Guiana west of the Essequebo, and therefore to the Mother Colony of British Guiana, it would be well at the present moment to show the utter baselessness of such a claim. In the last number of this Journal we dealt with the position of affairs during the sixteenth century*; we shall now bring forward evidence to prove that Spain *never* occupied any portion of Guiana, except a small tract on the east of the Orinoco far away from the coast.

During the sixteenth century the provinces of Spain were more or less consolidated, with the result that the Spanish Indies consisted of the larger islands of the Caribbean Sea, and the coast from the Gulf of Paria to the Isthmus, as well as portions of Central America, Mexico and Florida. The coasts beyond these to both north and south, as well as the Caribbee and Bahama islands were entirely abandoned, leaving the whole of Guiana and North America beyond Florida undisturbed. Not that Spain ever abandoned her claim to the whole of America; she resented every attempt of other nations to occupy these countries, notwithstanding their utter uselessness to herself. Relying on the Papal Bull the authorities did everything in their power to prevent other nations from even sailing along the shores of America, and the story of the fight for a share of the

* Page 1 of the present volume.

great continent is one of the most interesting in history. The English sea-dogs of Queen ELIZABETH'S time argued that the sea and trade were common to all by the law of nature and of nations, and when the first licenses for plantations were granted they were for territories "not possessed by any Christian Prince or people." This proviso was contained in the first grants to Sir HUMPHREY GILBERT and Sir WALTER RALEGH, which, as it were, threw down the gauntlet to Spain. Under these licenses Virginia was established, and although Spain said but little as long as the strong-minded TUDOR Princess lived, no sooner had the weak JAMES come to the throne than her protests and threats were both strong and loud. These culminated at the time when the marriage of Prince HENRY to a Spanish Princess was projected, and when JAMES was desirous of conciliating Spain in every possible manner.

Virginia did not progress to any extent during the reign of JAMES the First, mainly for want of the Royal patronage. The King hesitated a great deal, as to allowing the claim of Spain, but ultimately public opinion was too strong for him and nothing was done to withdraw the colony. The dispute came to a head from 1611 to 1613, and as may be seen from the State Papers of the time it created a great deal of ill-feeling in Spain. In April 1611, Sir JOHN DIGBY, English Ambassador in Madrid, said that the Spaniards were so much troubled that they knew not how to behave themselves in the business. Ships had been built at Havana, said to be ordained for a journey into Virginia, and were then at Lisbon. The rumours of an expedition were repeated during the whole of that year, and in June 1612, DIGBY said they were very

much displeased with the plantation in Virginia, "which they stick not now to say that, if His Majesty (King JAMES) will not cause it to be re-called, the King (of Spain) will be forced by a strong hand to essay the removal of it." In September, he held it for certain that the plantations of Virginia and the Bermudas would not be permitted, but that the Spaniards would serve them as they had done the French in Florida. Six months later he said it would be requisite that those of Virginia live in a continual expectation of being assailed, for first or last the Spaniards would certainly attempt them, for thereof they already made profession. Then the rumours became less warlike, and the Ambassador stated that many Spaniards hoped the colony would fail of itself; their project was suspended for a time on account of reports that great misery and distress existed in the colony.

Such was the state of affairs when the first English grant was made in Guiana. The country was then considered to extend from the Orinocó to the Amazon, with "an immense stretch into the countries that border upon Brazil on the South-side, and New Andalousia on the West."* The whole of this great territory was unoccupied by Spain or Portugal and therefore in exactly the same position as North America beyond Florida. Finding that there was nothing to be gained from the country the Spaniards left it to its original inhabitants, who, although unwilling to have any dealings with them, welcomed traders of other nations.

At the extreme north-west lay Punta Barima, and near this Cape was the head-quarters of the Caribs or canni-

* A Relation of Guiana and of the Commerce that may be settled there, 1698.

bals. No nation had attempted to settle here but it was visited by Dutch and French traders from about the middle of the sixteenth century. Here Sir WALTER RALEGH'S man, FRANCIS SPARRY, says he could have bought an Indian woman for a common knife, in the slave market which seems to have become of some importance even at this early period. The Spaniards from Trinidad and Margarita now and then made excursions as far as the "Kingdom of Moruca," but these were only raids for the purpose of stealing provisions from the Caribs. KEYMIS speaks of such a raid having been carried out just before his arrival in 1596, when an Arawak from the Barima led the enemy against the Caribs. He states that this had brought about an attempt at combination against the Spaniards, but whether an Indian alliance followed is uncertain, it seems however as if something of the sort took place as we hear no more of such attacks.

The Dutch are reported as having settled in the Pomeroon as early as the year 1580, but this settlement was probably nothing more than a small trading station. There is also a report that the Spaniards attacked the Dutch in the Pomeroon about 1595 and drove them out, but there is little foundation for this. Spain was so very weak in this neighbourhood at the time that the settlements could hardly protect themselves against rovers much less send out a party of three hundred men as stated. In the Archivos de Indias is a report of VERA'S attempt to find "El Dorado," dated October 27th, 1597; in which it is said that the party captured on their journey five "Flamencos" (Dutchmen), in a boat, who were trading with the Indians of Barima. This goes to

prove what is quite certain that whatever doubts we may have in regard to early settlements in this district, there can be no question that the Dutch frequently traded there. In the same paper is a curious statement that VERA sent his Sergeant-Mayor to the River Essequebo, where "he went and learned very much news of the men who were clothed and fighting with arms." Whether this meant some fabulous tribe of Indians or a party of Dutchmen is doubtful as nothing further is given in the way of particulars, but the probability is in favour of the latter. The reason why he could not investigate the matter is given that, "not having sufficient men with him he did not wish to tarry about the rivers."

The only real attack made by the Spaniards on the Dutch was reported by the Lieutenant-Governor of Trinidad in February 1614, and we have to thank Mr. REDDAN for extracts from the original document. This is probably the foundation for the reported attack on the Pomeroon, unless that other raid upon Araya in 1605 was misquoted.

Twelve men from Trinidad, twenty from Guiana (probably St. Thome), and a priest started from Trinidad in August 1613. In sixty days they reached their destination, the "Corentines," having been delayed by severe weather and great danger from the Caribs. On their arrival they waited until night before attacking the Dutch, who dwelt in a strong fort well protected; their presence being betrayed however by the barking of a dog, they were forced to proceed at once. They called upon the inmates of the fort to surrender in the name of the King, doing this three times before attacking. The Dutch replied with a refusal, saying they would rather die, and

fought as brave men should, with the result that the Spaniards suffered much loss. Finally, to protect themselves from further losses the attacking party resolved to set fire to the fort, which they did, with the result that it was soon in a blaze, on account ot its palm-thatched roof. Even then however the Dutch refused to surrender, preferring rather to die in the flames, but their Carib friends who had assisted in the defence managed to escape. How many were in the fort is not stated, but as the attacking party only numbered thirty-two, we may presume that it could only have been a very small party.

After the building was destroyed the Spaniards found a large number of knives, cutlasses, axes, guns, and other articles used for barter with the Indians, which they carried off. They also destroyed a large tobacco plantation, which was in a flourishing condition, "for it appears that this planting of tobacco is one of their special objects, although they carry on much trade with the Caribs and other Indian nations." Before leaving with their booty they also captured two Dutchmen who said they were not of the same party but had come from a place four days distant, to which they were expecting the arrival of several Dutch vessels with stores and settlers; these ships were to be laden with tobacco and other produce for Holland. The report also states that measures were taken to uproot all the Dutch settlements on the coast, but no account is given of these settlements nor does it appear that anything further was done.

The expedition took seven months in going and returning from the Corentyne, and the report concludes by stating that a great service had been rendered to GOD and His Majesty by thus dislodging the Dutch from their

settlements in that territory. Taken altogether the whole affair was nothing more than a plundering expedition, and instead of dislodging the Dutch from Guiana, we know that it made little if any impression. This is proved by other Spanish documents.

That Spain had no force in the neighbourhood to prevent trading in Guiana, is shown by another report from Trinidad dated June 16th, of the same year. The Lieutenant-Governor there stated that men and munitions of war were much wanted for the defence of his Government and Santo Thomé de la Guiana, and he earnestly prayed His Majesty to order that they be furnished with a supply as soon as possible. The cost might be deducted from the proceeds of the produce sent, which shews that the Spanish colonists were required to defend themselves at their own cost. Such being the case it would be out of the question to defend the Coast of Guiana, or even the seaboard of Venezuela.

On the 10th of July 1613, the Governor of Margarita reported to the King of Spain that the Dutch and English, favoured by the Caribs, were founding settlements in the province of the peaceful Arawaks, not far from Margarita, and that they had large tobacco plantations in the territory. He asked for permission to drive out the whites and reduce the Indians, but it does not appear that any action was taken. Two days later the same official said it would be well to drive out the English and "Flamencos," before they had fortified themselves, as otherwise great injury would be done to the village of Santo Thomé. "If there be any delay it will require considerably more men and means, to drive them out, even if it be possible then to do so." In June of the same

year the Municipality of Trinidad stated that the island was surrounded by enemies and that a privateer was then entering the port with the object of destroying it. About the same time the Deputy Governor of Santo Thomé reported to a similar effect in regard to the English and Dutch, and that in the "Corentines" there were over fifty married "Flamencos," besides others with Carib wives, whom he was unable to drive away for want of men. Between the Marañon and the Orinoco there were three or four more flourishing settlements where they were "making themselves Masters of the possessions and fruits of the *natives*."*

In a letter dated June 1614, the Acting Governor of Trinidad reported thai he had hanged certain "Flamencos," whom he captured in a boat, and that on account of the warm reception he gave to those who came reconnoitring the Coast of Trinidad they had not returned; therefore the traders were driven away from every point of the island. But, he continued, in the river Orinoco, in Santo Thomé, the traders were then located and those parts were constantly visited by ships. Then he goes on to mention that an "Armada" of Caribs, sailing in company with Dutch vessels, was on the Coast of Trinidad, and he much feared they were come to revenge the burning of their castle in the "Corentines." The island was then surrounded by "Flamencos," who in company with the Caribs "come to the city, robbing, plundering and stealing Indians, and harassing the poor inhabitants in every possible way."

In this same year, 1614, it was reported to the King

* The reader will note that it was the possessions of the natives; not of Spain or her King.

of Spain that the Dutch had drawn up a Map of Guiana, whereon was marked and noted all places, rivers, creeks, bays, capes, &c., from the river Marañon to the river Orinoco, extending as far as Margarita. On this map it was stated that the Dutch had surveyed the whole coast, and even forty leagues of the river Orinoco, as far as the Caroni, with the special object of founding settlements in *all* that coast and territory, for which sites had been chosen and designated on the map. It was proposed at that time to get up a Company in Holland to settle Guiana, but on account of the seven years' truce with Spain, which then commenced, the Company was delayed until 1621, when the well-known West India Company was established, with a grant of all unoccupied lands on the East Coast of America.

From all this it can be easily seen that Spain never made any attempt to occupy Guiana to the east of the Orinoco before the year 1612, and that the country was not possessed by any Christian Prince or People, unless the Dutch came under this designation. It may be objected perhaps that the Hollanders carried on their work in Guiana as enemies of Spain, but as they did little beyond a quiet trade with the Indians this aspect will hardly bear investigation.

We now come to the English grants. At the time when Spain was making such an outcry against the occupation of Virginia, King JAMES I, granted a portion of Guiana to ROBERT HARCOURT, his friends and associates. LEIGH had already established a colony on the Oyapok ten years before, apparently without the King's license, but now on the 13th of February 1613, England officially recognized that Guiana was open to all. Pos-

sibly the action of the Dutch may have paved the way; however, the die was cast, and what is all the more curious, by a sovereign who had a sneaking friendship for Spain. In the preamble to the "Letters Patent," it is stated that HARCOURT had adventured to put himself and many other of his good friends into great travailes, charges and expenses, by undertaking many long journeys by sea and shipping into the country known by the name of Guiana, inhabited by heathen and savage people, *not subject to any* Christian State, Government or Commonwealth. The document then goes on to define the grant, which was of all that part of Guiana lying between the river of Amazons and the river of Dessequibe, with title to lands, islands, jurisdictions and a host of other things, also all and singular islands, lands and territories within twenty leagues thereunto adjacent, not being actually possessed or inhabited by any Christian Prince or State in amity with us.

Very little was left for the Dutch, when we reckon that the grant extended sixty miles beyond the Essequebo, but we may presume that they were purposely left to occupy the region up to the Orinoco. In the same year Fort Kyk-over-al is said to have been erected, aud this has a most important bearing on the boundary question as it controlled the mouths of the three great rivers of what is now British Guiana.

HARCOURT'S grant does not appear to have been disputed by Spain; perhaps because Virginia and Bermuda were receiving so much attention at the time. It was the RALEGH expedition which brought Guiana into notice and which caused so much difficulty. The Commission from King JAMES to the unfortunate Knight assumed,

like the Letters Patent to HARCOURT, that Guiana was unoccupied. The preamble speaks of RALEGH intending a voyage to some part of South America, possessed and inhabited by heathen and savage people; he was therefore granted full liberty to carry such wares as were esteemed by the wild people of those parts, to barter for gold, silver and other things, and to import these things into England on consideration that he paid the King his usual fifth of all treasure.

After RALEGH was arrested and condemned, he wrote an "Apology" for his late voyage, in which he declared that Guiana belonged to the King of England, because the natural heads (the Carib chiefs) had most willingly acknowledged Queen ELIZABETH to be their sovereign. He also argued that if the country belonged to Spain he had no more right to go there for gold than the servants of the King of Spain had to come to Cornwall for tin. To set up a town of sticks covered with leaves and call it St. Thomé, was not taking possession of the great Empire of Guiana, for the Spaniards had neither reconciled nor conquered any of the Caçiques of the Country.

However, his arguments availed him nothing in face of the fact that JAMES wanted to remain friendly with Spain, and was disappointed by not getting the expected treasure; this latter perhaps the more important factor in producing the sad result. RALEGH was executed, and Guiana was almost but not altogether abandoned for a time, for HARCOURT'S colony still existed It naturally followed however that little progress was made until Captain ROGER NORTH came upon the scene in 1619. He appears to have come to an arrangement with HARCOURT, the result being the Amazon Company, which re-

ceived a Patent from the King. This however was revoked shortly afterwards owing to protests of the Spanish Ambassador, and NORTH, who had "secretly embarked" for Guiana, contrary to command, was imprisoned on his return. His ship with her cargo was also seized, but even then, notwithstanding many attempts to confiscate them on the ground that NORTH had obtained his cargo from Spanish possessions, nothing could be done. After spending seven months in the Tower, NORTH was released and his tobacco given up.

This again checked English trade and enterprise in Guiana and it was not until the death of JAMES that it revived. However, it was not Guianaal one that suffered by this want of policy, but Virginia and the Bermudas as well. It may be safely affirmed that if Queen ELIZABETH'S successor had been like-minded to herself, many difficulties experienced by these pioneers of the British Empire would have been avoided. However, CHARLES the First came to the throne in 1625 and at once commenced to initiate a new state of things. Hardly a month passed before a proposition was made to the King for incorporating a Company for the defence and protection of the West Indies, and in March 1626, NORTH petitioned for the renewal of the Letters Patent of HARCOURT and the Amazon Company. He then stated that the country was inhabited by many nations of different languages, who would rather admit any Christians than Spaniards or Portuguese. His request was granted and a bill prepared, giving him, ROBERT HARCOURT, and others, the same extent of land and the other privileges contained in the two grants of the 28th of August 1613 and the 1st of September 1619. Thus the

English were again nominally in possession of the whole of Guiana from the Amazon to twenty leagues west of the Essequebo.

Before proceeding to mention the third claimant to Guiana, France, we must come down to Lord WILLOUGHBY'S grant of Surinam in 1663. NORTH'S colony had failed, and several other English settlements also rose and fell, not however from any action of Spain. WILLOUGHBY sent his first colonists to Guiana in 1650, and Surinam, which is said to have cost him over £50,000, was then in a better condition than any of its predecessors had ever been.

In July 1660, CHARLES the Second gave a Warrant for a grant of the whole of Guiana to Lord WILLOUGHBY. Objection was however made to such a large grant, not however on account of the claims of other nations, but because the gift of 1,200 miles in length and 600 in breadth, to one subject, with the title of proprietor, was without precedent. This led to some delay, but at last on the second of June 1663, Letters Patent were given for the territory on both sides of the Surinam river, from a mile beyond the west bank of the river Copenam to the same distance east of the Marowyne, extending inland "southward up into the land to the heads and springs" of the Surinam river.

It is interesting to note here that when a river was made a boundary, both sides were included; in this case we have a mile of land on the further bank, and in the case of the large grant twenty leagues beyond the Essequebo and the Amazon. In connection with our claims to the watershed of the Essequebo, it will be well also to notice that Surinam extended up to the heads

and springs, meaning also the tributaries of the main river.

As this was the last English grant in Guiana we must now proceed to the French claims. Although little is said about the French in the Spanish records, it is an undoubted fact that traders of that nation were on the coast at a very early period. In 1643, the Cape North Company received a grant of Guiana from the King of France, but our authorities do not give the boundaries of this concession. However, it is certain that in 1652, LOUIS XIII granted to the Equinoctial Company the exclusive right of trading and settling between the Amazon and the Orinoco, this going to prove that France like Holland and England considered the territory unoccupied by Spain.

We now come to another side of the question. Spain never fought with any other nation to rescue Guiana from its clutches, but the different settlements, as they became of some importance, aroused the cupidity of their neighbours. We have seen already that if either Dutch, English or French, had good titles to Guiana, the evidence is most favourable to the first. Such being the case we may presume that the Dutch would do their best to keep out other nations. Down to the time of the first Dutch war however, Hollanders and English were friendly rivals and did not interfere with each other. It followed therefore that it was only with one French colony that a little difficulty arose.

The French had made several attempts to settle in Cayenne during the first half of the seventeenth century, but as one colony after another was abandoned, in 1656, some Dutchmen took possession of the place, for which

a Charter was granted to DAVID NASSY and others in 1659, by the West India Company. The French however were not prepared to abandon what they considered their rights, and, arriving in 1654, compelled the young colony of Dutch and Jews to surrender.

That the West India Company considered itself the owner of the whole country of Guiana is proved by a number of grants. In 1657, the Company was financially almost bankrupt and could do little for Guiana, but a number of Zeeland merchants, not liking to see the settlements reduced so low, got a concession for the whole territory from Cape Orange near the Oyapok to the Orinoco, or, as some of the authorities say, from one to ten degrees north latitude. They called the territory *Nova Zeelandia,* and the agreement speaks of the colony of the "Great Wild Coast" up to ten degrees. Attempts were made to procure settlers, by issuing pamphlets, offering free land and other inducements, some of which were translated into German with a view to catch emigrants from other places than the United Provinces. As a result of this the first Pomeroon colony was started, without, as far as we can glean, the slightest opposition on the part of Spain.

The Essequebo colony was at this time (1657), little more than a trading station, but as such it was of some importance from the immense stretch of country behind. The country was fairly well populated by Indians, whose trails extended hundreds of miles into the interior, far beyond the SCHOMBURGK line. For a long time the Dutch had taken up smoking, and it was mainly from Guiana that they obtained their supply of tobacco. Kyk-over-al was the great trading station, and from this fort

and store went perhaps a score of traders to different parts of the country. Not only did they journey into the interior, but also along the coast, into every river of what is now the North-west District and up the Orinoco as well. As there were no Spanish settlements nearer than the village of St. Thomé they never met with any opposition, for they had taken care to conciliate the natives by declaring themselves at enmity with Spain. In view of the absurd claim of our neighbour we may here mention that the ancient settlement was on the west side of the Essequebo, and that for about a century no attempt was made to settle on the other bank.

The Pomeroon was subordinate to Kyk-over-al, and of more consequence as a settlement than as a trading station, but no doubt, as in the case of the latter colony, some Indian traffic was carried on and produce collected from all parts of the district. Having few negroes the colonists were obliged to get Indian slaves which they procured from the Orinoco, buying them at the Barima slave market or elsewhere from the Caribs.

Since RALEGH'S time the Caribs had remained faithful to the English, and in any dispute between that people and the Dutch generally took the side of their old friends. RALEGH'S name was one which acted as a charm upon the savage cannibals of Caribana, and this feeling was utilised by Major JOHN SCOTT in 1665. In his petition to King CHARLES the Second, he stated that he was employed with a small fleet and a regiment of foot in an expedition against the Dutch at New Zeeland (Pomeroon), Desse Cuba (Essequebo) and Timberan (Demerara ?), in which by the assistance of the Caribbee nation he burnt and destroyed the enemy's towns, forts, goods

and settlements, to the value of £160,000, and spent 73,788 lbs. of Muscovado sugar. During the war Surinam was taken from the English and Essequebo was recaptured, but the Pomeroon colony never recovered. Finally, most of the settlers went over to Surinam and for a time even Essequebo was much depressed. This desertion however can be no argument for a Spanish claim, for it was the Caribs and English who put the colonists to flight.

In 1670 the West India Company resumed possession of Essequebo, the *Nova Zeelandia* Company having virtually been ruined by the war, and the colony was offered for settlement to the citizens of Zeeland. The Company however, had not respected its tenants the year before, for it offered a grant in Guiana to the Count of Haynau, through his Privy Councillor, JOHN JOACHIM BEKKER, who proposed to found a German colony. Except the "island" of Cayenne, the whole of Guiana was now in the hands of the Dutch, since Surinam had been exchanged for what is now New York. The draft of the concession, which was never completed, granted a piece of land "on the Wild Coast of America, between the river of Oronoque and the river of the Amazons, *which His Excellency will be entitled to select*, provided he keeps within six Dutch miles of the other colonies" of the Company.

Here we have a plain statement; the Company's possessions extended from the Orinoco to the Amazon and the Count might have his choice. Under a similar grant a German colony was actually established in the Oyapok, but this was so close to Cayenne that the French rooted it out. However, although not successful, it goes to prove that the Dutch claim to the whole of Guiana

was something more than a mere boast. It is also noticeable that the boundaries of the concessions were stated, and strict regulations made that they should not be infringed. If Essequebo had ever been granted to outside parties we should have had something beyond the general statement that the Company's possessions reached to the Orinoco, but even as it is the evidence is so overwhelming that anything more would be superfluous Essequebo was the Company's private trading station and the authorities were very jealous of their rights, as may be seen from an incident which took place in 1672. The proprietors of Berbice had received several Charters, which reserved the Essequebo and any other rivers where the Company had settlements; outside their own boundaries they were neither to settle nor trade with the Indians. In 1672 ADRIAN VAN BERKEL was Secretary and Factor of Berbice; a very enterprising trader, who not confining himself to the Berbice river, established himself in the Demerara as well This did not please HENDRIK ROL, the Commandeur of Essequebo, but he said nothing until he found that a sloop had been sent to trade in the Pomeroon. This he seized, with its cargo of negotiæ and took to Kyk-over-al, leaving the crew to go back in an Indian corial and bear the news. It resulted that VAN BERKEL went over to Kyk-over-al, and after a long discussion agreed to confine his operations for the future within the boundary of the Abary Creek. The sloop was therefore restored and payment made for the negotiæ, which had been used.

From this it will be seen that whenever the Dutch authorities were able to control the monopoly of the Orinoco trade they did so, but it is most noticeable that

not a word was ever said about Spain. She was entirely beyond consideration, as her possessions were so far away; the rivals of Essequebo were English and French traders and pirates.

In a report of the Governor of Barbados, sent to the English Lords of Trade and Plantations in 1676, it was stated that a few privateers came that way (*i.e.* to Barbados), whose prey was on the Spanish coast; "sometimes a little rogue creeps in here for wood, water, or fresh provisions, who, not able to bear up with those Alexanders of Hispaniola, lies sneaking about the Dutch plantations." This almost certainly meant the coast between the Pomeroon and the Amacura, and not Surinam proper, which was too far to windward of their field of operations.

Indian slaves were undoubtedly bought from the Caribs at the market of Barima, and in 1673, Captain PETER WROTH deposed in Barbados, that he had visited Essequebo, where he was ambuscaded, after which he went on to the Caribs in Amacura and victualled. He stated that great hatred existed at that time between the Caribs and the Dutch, but the natives were friendly to the English. These difficulties with the true owners of the mouth of the Orinoco were however not of long duration, for we find the Dutch trafficking with them almost without intermission.

ABRAHAM BEEKMAN, who became Commandeur of Essequebo in 1678, wanted to carry on a regular trade in the Orinoco, but the Company said that it would not be safe, as if he went there the Spaniards might want to come to Essequebo. During his administration the Pomeroon colony was re-established and the Barima

Post erected. It appears as if, when the Directors refused to allow BEEKMAN to risk his trading boats within the Orinoco, he compounded the matter by keeping up a station near its mouth. During the French war, which commenced in 1689, the Pomeroon colony was destroyed a second time, it is said, by a French pirate who had established himself in the Barima. About this time, probably on account of its exposed position and the vicinity of the pirates, the post was abandoned. Nevertheless, the trade in that neighbourhood was continued for a long period, the slave market being a great convenience to the pioneer colonists, who never could get enough negroes for their plantations. In 1717 a proclamation was issued to regulate this traffic, which was confirmed in 1752, under which every inhabitant might own six Indian slaves, and no more, to be procured from the Orinoco by purchase or exchange. The trade was ultimately given up as negroes became more plentiful and as more attention was paid to planting, but its gradual decrease was certainly not due to any action of Spain.

Having shewn that our Dutch predecessors controlled Guiana up to the Orinoco in early times we must now come to another and later aspect of the matter.

As plantations grew up negroes were imported in greater numbers and desertions became frequent. Even before the removal from Kyk-over-al to Fort Island Indians had been employed to hunt runaways who fled into the bush; afterwards they were regularly subsidised for the purpose. Some petty disputes took place now and then between Dutch and Spaniards on account of the runaways being harboured by the latter, when they

managed to escape to the Spanish settlements, but there is no evidence to show that these ever amounted to a boundary question. Both Spaniards and Dutchmen hunted runaways in the district between the Orinoco and the Pomeroon, but the Dutch authorities considered that their neighbours were intruding when they came beyond the Barima.

In 1754, on account of the continual desertions of slaves, the colonists petitioned the authorities to establish a post on the Moruca, which however was not done at that time for want of funds. In the same year there were rumours of a probable invasion from Spanish Guiana, which arose from an expedition being set forth to survey the boundary between the Spanish and Portuguese territories. It is however interesting to note in this connection that preparations were made for defending Essequebo, which included an armed boat to be stationed at Moruca.

The Moruca post was again projected in 1779, but on account of the war and the capture of the colony by English and French successively, nothing was done until ahout 1793, when a line of posts was established in anticipation of a French invasion. It is hardly necessary to go into the matter of the attack on this post in 1797, as it was not connected with a boundary dispute ; the British had possession of the colony and was at war with Spain. Other Spanish raids on the Pomeroon in the early years of this century may be dismissed for the same reason.

Instead of finding evidence of disputes with the Spanish authorities we on the contrary see that the Governors of the neighbouring colonies were on very good terms. An

agreement was made for the delivery of runaways who might be captured by either colony; Dutch slaves to be given up by the Spaniards and Spanish deserters by the the Dutch.

That this matter of runaways was one of prime importance under the slavery system is shewn by the trouble produced by Bush Negroes in Surinam and Maroons in Jamaica. That similar difficulties were absent from Essequebo was due to the system of posts and Indian presents. The postholder at Moruca and afterwards in the Pomeroon distributed the annual subsidies to all the natives, (or rather to their Chiefs), living in the district from the Amacura eastward, while he who resided on the site of what is now the Penal Settlement provided for those of the Cuyuni, Masaruni and Essequebo. Later, these presents became such a burden upon the colony that they were much reduced in value, and finally at the Emancipation were discontinued altogether. But, the general result of the system was a permanent friendship and alliance with all the Indian tribes on the east of the Orinoco, who may be considered from one point of view as protected native races.

If, from this point of view, the Dutch were in alliance with the Indians, in another aspect the former may almost be considered as tenants of the Caribs and Arawacks. This aspect was emphasised by the British Governor, HUGH LYLE CARMICHAEL, in 1812, who resented the implication by stating that the Indians must be convinced that the Government would only bestow friendship according to their good behaviour. The vessel containing the supplies had been captured by the enemy, and as a result a large body of Arawaks had

come down and demanded what they considered their rights, threatening that if the presents were withheld they would capture some of the negro slaves. However, such threats and peremptory demands could not be enforced at such a time, although we may presume that at an earlier period the young colony would not have been in a position to ignore their claims.

Even the Spaniards had to admit that the Caribs were a power in the land, for they complained of their allowing the Dutch to reside in their (the Indian's) territory. The reader will note that it was Carib territory and not Spanish possessions that the Dutch occupied. The following extracts from DEPONS' "Voyage a la Terre-Ferme," gives the Spanish view of the case; speaking of Spanish Guiana he says:—

"This territory is divided into Upper and Lower Guiana; and the capital has been adopted as the point of division, though the river Caroni seems better calculated for this purpose, as it forms the western boundary of a portion of Guiana, that is insulated by having the Oroonoko to the north, the sea to the east, and the river Essequibo, to the south. This district, intersected in all directions by numerous rivers, which have for time immemorial contributed to increase the quantity of vegetable mould on its surface, is surpassed, in point of fertility, by no other portion of territory, throughout America.

"The missionaries who were first deputed to civilize the Indians by the introduction of Christianity, began their operations in this part of Guiana. But, though the erection of twenty-seven villages to the east of the river Caroni, attests the success of these early missionaries, they have never ventured to approach nearer to the

coast than thirty leagues, from its being inhabited by Caribs, the most ferocious of all the Indian tribes, who have never failed to massacre the preachers of Christianity sent to convert them. There can be no doubt that the ferocity of the Caribs would have in time yielded to the efforts of the missionaries, had they been left to the impulse of their own feelings; but the Dutch of Surinam, who are interested in extending their commerce into Spanish Guiana, have uniformly endeavoured to foment the hatred of the Caribs against the Spaniards, with a view to prevent the approach of the latter towards the coast. It is, in fact, certain, that Spanish Guiana, which in the best charts is made to occupy thirty leagues from the mouth of the Oroonoko to cape Nassau, never extended so far in that direction; the natives, who have uniformly asserted their independence, and, never having been either converted, reduced, or subjugated, continue still as free as they were before the discovery of the New World.

"The Dutch have always strenuously endeavoured to maintain a strict alliance and friendship with the Caribs. In this they succeeded more readily, as they never inculcated on them the rigid and troublesome morality of the Spaniards, but, on the contrary, made every allowance for the difference of their manners and habits. It is even affirmed, that on all occasions they never failed to foment their hatred against the Spaniards, and to attach them to their own interest: what appears to prove the truth of these assertions, is the liberty that the Caribs have granted them of keeping a military guard in their territory, with a view to protect the contraband traffic which they carry on.

"The Spaniards of Guiana, and the Dutch of Surinam, are therefore far from living on terms of amity with each other. The Spaniards affirm that the Dutch do not respect the boundaries between the possessions of the two countries, but are continually encroaching on their territory; that they injure the Spanish commerce in Guiana, by the constant traffic which they carry on; that they continually excite the Caribs to revolt; and that they prevent their subjugation by the arms with which they supply them.

"The Dutch in their turn ascribe the desertion of their slaves in Surinam to the Spaniards, who, they assert, never fail to afford them an asylum in Guiana. It must be admitted, that for a long time the Spanish government favoured the slaves of Surinam, who fled to them for protection, more out of hatred to the Dutch than from principles of humanity. They have even peopled with these fugitives two very considerable villages on the banks of the river Caura, into which are also received the Indians, whom the Caribs force to fly, in order to avoid becoming the slaves of the Dutch. From such a heterogeneous population, without civilization, it is greatly to be feared, that sooner or later the public tranquillity may be endangered.

"These, and similar complaints have continued to be made by the respective governments for the last seven or eight years, and different treaties have been entered into, with a view to remedy such evils in future. One of the stipulations is, that the Spaniards shall either send back, or pay the full value of every slave who takes such refuge in their dominions. If this condition continues to be faithfully executed, it will greatly

tend to preserve harmony between the two countries."

* * * * * *

"With a view of better protecting Guiana from foreign attacks, the Spanish government has placed the capital at the immense distance of ninety leagues from the mouth of the river; but, in my opinion, this purpose would have been more effectually accomplished by placing it nearer the sea; since an enemy in this case could not have penetrated into the country till they had first rendered themselves masters of it. Whether we consider the subject in this point of view, or with respect to trade and navigation, it must, I think, appear evident, that a worse situation could not have been chosen."

How very absurd the Venezuelan claim to the Essequebo appears in face of these facts! To sum up they prove:—

1. From their own authorities that Spain never occupied, or possessed any portion of the territory between the Orinoco and the Amazon.

2. That Holland, England and France, occupied the country because it was not in the possession of any Christian Prince, and as being in the same position as North America beyond Florida.

3. That Holland not only considered her territory to extend up to ten degrees north latitude, but went so far as to offer the Count of Haynau any place he might choose between that point and the Amazon.

4. That the Dutch established the mother colony of British Guiana on the *west* side of the Essequebo, and by conciliating the natives controlled not only our North-west District, but the Lower Orinoco as well.

5. That the actual possessions of the Dutch on the west side of the Essequebo were Kyk-over-al and its neighbourhood, the west bank of the river, the Pomeroon and Moruca, and finally the Barima, while Spain had only the village of St. Thomé, fifteen days' sailing from the last point.

Report of Society's Meetings.

Meeting held July 11th.—Hon. B. Howell Jones, in the chair.

Members present 9.

Elections.—*Members:* Messrs. H. Wells Laing, A. B. Barnard and J. R. Hosken; Drs. G. E. M. Thorp and I. K. Reid and the Revd. M. J. Stent.

Associates: Messrs. Thomas Dalgleish, Charles Ross, Cecil H. Fitzgerald, Harrie E. Belgrave, J. J. Wilkie and U. S. Grant.

Mr. Luke M. Hill's paper on Food Adulteration having been declared open to discussion, the Chairman said the only objections that he saw to the paper was that it was too short and dealt with so few items that he hoped Mr. Hill would supplement it with other papers. Professor Harrison might give them a great deal of information, but he seemed to think it advisable not to say too much for fear of frightening people.

Mr. Hill said he had dealt mainly with the principal adulterations found in the colony. Since he had spoken of the Nonpariel Dairy, Mr. Harry Garnett had sent him the following description of the plant used on that estate:—

The plant consists of a powerful Separator with engine and gearing, Butter worker, Churn and Pasteurizer. The milk is bought from the Coolies in a room situated over the Dairy, it is measured and a ticket given with a number. The milk is then poured into a receiver which delivers into a feed tank of the Separator, in this the milk comes out of one spout and the cream out of another, the skimmed milk is then taken by a small centrifugal pump and pumped over the Pasteurizer. This consists of a long column, the top half being filled with steam and heated to 180 Fahr., and the

bottom half is a refrigerator, through which cold water passes, carrying the milk down to a normal temperature. The advantage of this is, that if there happen to be any germs in the milk they are destroyed and milk treated in this way keeps much longer.

The churning is done with cream that has been ripening for 24 hours.

The business in Georgetown is about 150 pints of fresh milk, which is also Pasteurized before it comes down, and 100 pints of skimmed milk, and 20 lbs. of butter per day, with a varying quantity of cream. The Dairy is capable of turning out 1 ton per week. We have also a cheese making plant, and a press for cream cheese.

The plant was started in 1891, and has worked steadily every day up to the present, including Sundays, without a stoppage. We deal on the average with about 36,500 gallons of milk per annum. As you will see a very small proportion of this is sold, the balance we make into salt butter and use it on the estate, and the skimmed milk is given to pigs, of which I have a herd of nearly 100, imported from Saunders Spencer, who is the best breeder of Yorkshire pigs in England. The pigs fed on skimmed milk put on 20 lbs. per month, and this is the only thing which prevents the actual Dairy work proving a loss.

Dr. Deane criticised the paper, and spoke of milk as being not altogether such a nutritious food as was generally supposed on account of its containing no iron.

The thanks of the Society were accorded to the Government for a copy of the Statute Laws and a number of parts of the Board of Trade Journal and Journal of Patents.

Mr. Quelch said he would like to publicly acknowledge the receipt by the Museum of a specimen of Xiphosma hortulanum from Mr. John Wilson. It was a rather scarce Boa which mimicked the poisonous labaria so much, that it was sent as that species. So great was the resemblance that it even had fangs similar to those of poisonous snakes and might be easily mistaken, although as a matter of fact it was quite harmless.

In reply to a question of Mr. Vyle, Mr. Quelch said

he had heard no further news of the Chicago medals although nearly a year had passed since they had been announced as soon to be ready.

The meeting then terminated.

Meeting held August 8th.—Hon. E. C. Luard, President, in the chair.

Members present 10.

Elections.—*Associates:* Messrs. G. M. Fraser and J. L. Wilson.

Mr. Æneas D. Mackay gave notice of motion as follows:—

"That this Society communicates with the Government in order that H. B. M. Ambassador at Washington be requested to bring to the notice of the U. S. Government authorities, the very great delay in the despatch of Diplomas and Medals, awarded Colonial exhibits at the World's Columbian Exposition in 1893."

The President stated that he expected to get a paper on Multiple Effets for the next meeting from Mr. Scard, and that Mr. Byrd had also promised a paper. The latter gentleman had been successful in Mauritius in restoring the fertility of soils, and was, now, he believed making experiments in this colony.

Mr. R. G. Duncan read the following from the editor of the *Louisiana Planter*, on the rice industry in the Southern States:—

1st. Yield of rough rice per acre. The average yield of the rice fields along the Mississippi river in average seasons might be placed at 10 barrels per acre, the barrel being an arbitrary unit of 162 pounds of rough rice, or paddy. In the western part of the state, in the prairie sections, where the facilities for irrigation are not very good, the yield would be scarcely so great. At times as large yields as 20 to 25 barrels per acre are had, and anything under 15 barrels could scarcely be considered as a good yield. A barrel of 162 pounds of rough rice is calculated to turn out in a rice mill about 100 pounds of cleaned rice,

ready for consumption. This cleaned rice may consist of 90 pounds of good merchantable rice and 10 pounds of broken rice, or here commonly called No. 2, which is generally sold to brewers for use in their industry.

2nd. The time required to grow and harvest a rice crop is a total of about six months. If one month be spent in the preparation of the land, then we estimate four months from the time of seeding until the harvest begins, and if the harvest prevail during one month this would make a total of six months. It is usual to plant rice in sections so that the maturity may not all occur at once.

3rd. Kind of pumps used for irrigation. In the past the bulk of our rice crop has been irrigated from the river by its superior height over the land. The Carolina and Georgia crops are produced exclusively in that way, the fresh water being so backed up by the diurnal tides that a competent fresh water flow is thus obtained for irrigation. When pumps are used they are ordinary centrifugal pumps, or else centrifugal pumps submerged under water with a vertical shaft enclosed in a wooden frame and driven by a belt at the top end of the shaft, the variety used being chiefly the Menge pump, that was formerly advertised in the *Planter*.

4th. Drainage required. The land should be drained in order to plough it, it requiring good ploughing to destroy the various grasses that would otherwise smother out the rice crop. In some of our low-lands it is customary to plough the land wet, turning the grass sod upside down and then planting the rice on top of the overturned sod, quickly irrigating it, and thus endeavouring to get the rice started in advance of the grasses. This is a precarious way of producing the crop, but it has been quite common in our very low lands. It is some-what similar to the East Indian plan.

5th. Kind of cultivators used for preparing the lands. The standard plan is to plough the land and to harrow it into a fine condition just as would be done for the planting of oats or wheat in other latitudes. The rice is then planted therein broadcast, or by drills, generally broadcast, by any one used to planting wheat or oats, and is ordinarily planted on the basis of about 80 pounds of rough rice per acre. As soon as the rice comes up it is desirable to keep the ground moist all the time in order to force its growth and to keep it ahead of grass and weeds. If this be not sufficient, the grass and weeds are pulled out by hand, which is a most expensive process and has of late years made the rice industry comparatively unprofitable in this state.

6th. Machines used for preparing rice. I presume that this refers to the matter of cleaning rice, which is done in regular rice mills, which for their purpose are as complete establishments as sugar houses are for the manufacture of sugar. The Shakspeare Iron Works that advertise in the *Louisiana Planter*, turn out a great deal of rice mill machinery and the George Squier Manufacturing Co , of Buffalo, N. Y., which also advertises in the *Planter*, manufactures machinery for the production of rice on a small scale. For threshing rice we use threshing machines similar to those built to thresh wheat, barley, oats, &c., of which there are many kinds easily obtainable.

7th. Labour required per acre to grow crop. We estimate that taking the time that we have named for preparation, say one month, that one man can plough, harrow and plant at least 25 acres.

8th. The average cost of preparing land might be placed at $1 50 per acre on the basis of wages at $1 per day, provided the lands are already cleared and ditched.

9th. Method of reaping the rice crop. Where the fields are sufficiently large the regular reaping and binding machines, such as are used in the wheat harvest, are now used. These machines cost, say $175 each, and with two men and four mules will cut and bind into bundles ten to twelve acres of rice per day. A large portion of the rice crop of Louisiana and the bulk of that raised along the Mississippi River is still cut by the old fashioned sickle, and one man can cut half an acre per day, spreading the cut rice upon the tops of the stubbles in order that the rice may dry in the sun, as otherwise it will be damaged by the contained moisture. Machine cut rice requires that the bundles be set on end until the heads are thoroughly dry. There is considerably more difficulty in this respect in handling rice than there is in handling wheat in the North. The rice once cut, it is bundled up in small sheaves or bundles, and when sufficiently dry, is put into shocks of 15 or 20 bundles each, and later into stacks containing 200 or 300 bundles, or else is threshed at once. If it be estimated that a man will cut half an acre of rice per day, say realizing from five to seven barrels of rough rice, we may estimate that the labour of one man would be required to bundle, shock and stack the same half acre, or five to seven barrels, these units of labour being readily calculable on your own bases.

10th. The use made of rice straw. There has been but little use made of rice straw thus far, the cattle eating it, but it is not considered very nutritious. It has some use in the cities as bedding for horses,

also for packing merchandise, crockery. ware, &c., but there is but little demand for it and much of it here is burned to get it out of the way.

Mr. Duncan said they were all aware that rice was grown in the colony to some extent, but that at the same time they were importing 250,000 bags every year. There was no reason why the whole of this should not be grown here, and it appeared to him that, if a company with a capital of $150,000 were started, it would not only be good for the colony but profitable to themselves. They had everything suitable, good soil, a suitable climate, plenty of water, and a body of labourers who had already carried on the cultivation in India. He had spoken to several persons and hoped that a Rice Growing Company would be started to supply at least a portion of the amount consumed in the colony.

The President in moving a hearty vote thanks to Mr. Duncan for reading the letter, and for his remarks, said he hoped there might be further discussion at the next meeting.

Mr. Jas. Gillespie in seconding the motion, said his difficulty in rice growing was to raise the water high enough without going to considerable expense.

After some discussion, in the course of which the names of the late Mr. Wm. Russell and the Hon. A. R. Gilzean were mentioned in connection with rice-growing, further consideration of the matter was adjourned.

The meeting then terminated.

Meeting held September 12th.—Hon. E. C. Luard, President, in the chair.

Members present 12.

Elections.—*Member*: Mr. F. I. Scard.

Associates: Messrs. John G. Bellamy, A. L. Duncan, Charles Schüler, Joseph E. Nicolls, Thomas Roy, and Peter A. Yip.

The following report of the Committee of Correspondence was read:—

The Museum, Sept. 12th, 1895.

Sir,—I have the honour, by direction of the Committee of Correspondence, to forward to the Society, the following report on the Horticultural and Poultry Show, which, by the kind permission of the Mayor and Town Council, was held in the Promenade Gardens on the 29th ult.

The Committee are glad to be able to report that the arrangements for the Show were entirely satisfactory, and that, as an exhibition-fête, it passed off without a hitch. This result was attributable to many reasons: such as the receiving of the greater number of exhibits the day before; the making of entries and delivery of entry cards to exhibitors being beforehand; the superintendence of different sections by different members of the Committee; and the continuous opening of the gates of admission.

Unfortunately there was a falling off in the number of exhibits, as compared with last year; and, owing to the counter attractions of the cricket match, the number of visitors was less. While, therefore, the Committee had made more extensive preparations and greater improvements for the effectiveness of the Show and the convenience of the public, the greater cost has not been met by any increase in the gate-money; and the Committee are therefore obliged to fall back on the guarantee of the Society to the amount of $198 34. From the experience gained, however, the Committee trust that it will be possible to reduce considerably the expenditure in future Shows, without curtailing their efficiency.

A comparison of the entries in the various classes of the exhibitions from 1893—1895, is shown in the following table:—

	1893	1894	1895
Class A. Plants...	37	108	135
„ B. Flowers and Decorations	39	47	45
„ C. Fruit	74	168	105
„ D. Vegetables	80	172	125
„ E. Economic Products (introduced 1894) ...	—	84	71
„ F. Miscellaneous	5	17	12
„ Poultry and Bees (introduced 1895)	—	—	42
	235	596	535

It is a noteworthy feature, tending to the encouragement of these shows, that although the number of exhibits was less than that of last year, the prizes given amounted to considerably more, $418 being awarded by the judges as against $358 for 1894. It is to be noted, too, that exhibits of special economic value, such as Kola, Poultry and horse feed, etc., although not specified in the prize-list, were recommended for awards by the judges. The new section of Poultry and Bees, proved to be a very popular one, and no doubt it will be considerably extended next year.

Without desiring in the slightest to interfere in the work of the new Committee for next year, the present members would recommend that some provision be made in future Shows for the restriction, to cottagers and the poorer classes, of certain sections of plants. Possibly, in this way, the smaller growers would be encouraged and stimulated. Complaints are at times made as to the period of the year when the Shows are held; but taking all things into consideration, more especially the varied nature of the exhibits, the desirability of fine weather, and the general slackness of the season, the Committee incline to the opinion that about the best time has been fixed upon.

Recognising the beneficial results which such Shows are calculated to produce, the Committee recommends that the Society make application to the Government for the annual grant of $500, for the Horticultural and Poultry Show, 1896.

I have, &c,

J. J. QUELCH,
Secretary.

The Museum, Sept. 12th, 1895.

The Treasurer's statement of the cost of the Horticultural Show was laid on the table. This showed a loss to the Society of $198 34.

On the motion of the President, seconded by Mr. Thomas Daly, a vote of thanks was accorded to the Committee and its Secretary, for the trouble they had taken with the Show.

The following correspondence was read :—

Government Secretary's Office,
Georgetown, Demerara,
12th August, 1895.

Sir,—I have the honour by direction of the Governor to forward herewith, for the information of the Royal Agricultural and Commercial Society, a letter which has been received from Mr. E. Tripp, Secretary to the Agricultural Society of Trinidad, together with a prize list and catalogue, with reference to an Agricultural Show to be held in that Colony in October next.

I have, &c.,
CHARLES T. COX.

The Honorary Secretary,
Royal Agricultural and Commercial Society.

The Agricultural Society of Trinidad,
Port-of-Spain, 23rd July, 1895.

Sir,—I have the honour to inform you that this Society will hold an Agricultural Show on the 16th, 17th, 18th and 19th October, this year, to which exhibits from other British Colonies will be admitted, and I beg to forward herewith the Prize List and Catalogue.

The Executive Committee will be pleased to see your Colony represented at the Show.

I have, &c.,
EDGAR TRIPP, Secretary.

The Honourable
The Colonial Secretary,
British Guiana.

It was agreed that the matter should be advertised in the local papers.

The motion in reference to Columbian medals and diplomas was postponed in the absence of Mr. Æneas D. Mackay.

Mr. Quelch exhibited a diploma that he had just received as Commissioner to the World's Columbian Exposition, and informed the meeting that the Exhibitor's medals and diplomas were likely to be ready after the end of October. The Americans themselves were complaining of the delay.

The President read a paper by Mr. F. I. Scard, on "The relation of Boiling Temperatures in Multiple Evaporation."*

The President said that Mr. Scard had taken a great deal of trouble with the paper and no doubt it would not only be interesting to sugar manufacturers in the colony but to outsiders as well. He hoped that at the next meeting some of the members would be prepared to discuss it. A vote of thanks was accorded.

The following report of Professor Harrison on the state of the Sugar Industry in St. Vincent was taken as read:—

Government Laboratory,
Georgetown, Demerara,
April 11th, 1895.

Sir,—I have the honour to forward to you the following as a report upon the state of the Sugar Industry in St. Vincent, into which, in accordance with the request of His Excellency Sir Charles Bruce, K.C.M.G., conveyed to me in your letter No. 130, of the 18th February, 1895, I enquired during my recent visit to that island.

2. During the fortnight I spent in the island I visited the following sugar estates:—Pembroke, Peniston, Clare Valley, Cane Hall, Fountain, Adelphi, Tourema, Orange Hill, Waterloo, Lot 14, Estate, Rabaka, Mt. Bentinck, Langley Park, Sans Souci, Prospect, Belvidere,

* See Page 233.

Brighton, Diamond, Rivulet, Peter's Hope, Mt. Wynn, Cane Grove, Villa, Calder, Argyle, Richmond, Fitz Hughes and Mt. Pleasant.

3. I have formed a very high opinion regarding the purely manual cultivation of these estates; the fields are in a state of high tillage, and kept in excellent order as regards weeding, etc., and I am unable to suggest any improvement upon the present methods of working up the land. In common with Barbados and Antigua, the lands in St. Vincent devoted to the production of sugar cane are kept in a state of what may be termed garden cultivation. But, on the other hand, as regards manures, on the majority of the estates in St. Vincent, the land appears to have been systematically starved for several years back, with the result that the lighter soils have lost to a great extent their power of retaining moisture. If St. Vincent is to regain its power of making fair crops of sugar the system at present prevalent on a majority of the estates must be abandoned, and far greater attention paid to the manuring with pen manure. On such porous friable soils as are the majority of those on the estates which I visited in St. Vincent, the retentive power of the soil for water during periods of partial drought is of paramount importance, and in practice this can only be attained by increasing the amount of humus (organic) matters in the soil. If soils in the tropics are deficient in this power the application of artificial manures to them may be worse than useless. On all sugar estates in St. Vincent it is essential to the successful cultivation of the sugar cane that a sufficient number of cattle be kept to produce enough *thoroughly rotten heavy* pen manure to thoroughly dress each field which it is intended to plant in canes. I am of opinion that on these light soils the use of green dressings applied directly to the soil cannot be recommended, as such a course would tend to render the land still more open. If all possible use were to be made of the exceptional oppportunities existing on many estates in St. Vincent for the preparation of pen manure, but little artificial manure ought to be required for the growth of maximum remunerative crops of sugar cane.

4. Until I have examined the samples of soils which I have requested may be forwarded to me for analysis, I am not able to give reliable advice about the selection of artificial manures for use in the Colony. I have, in the meantime, privately advised those proprietors who requested me to do so with regard to the system of manuring to be temporarily adopted on their estates during the present depressed state of the sugar

market. I may, however, mention that on many of the estates which I examined, the canes were plainly suffering from nitrogen hunger, and if a dressing of say 150 lbs. of sulphate of ammonia per acre had been given to them during the earlier stages of their growth the loss per acre upon these estates would have been very materially lessened.

5. During my stay in the Island I examined carefully into the occurrence of the rind fungus (Tricosphæria sacchari) among the canes. After giving full consideration to the matter and comparing what I noticed in St. Vincent with what I have seen in British Guiana, Trinidad, Grenada, Carriacou, Barbados and Antigua, I am of opinion that the fungus in question is not a recent importation into the West Indian Colonies, but a most widely distributed organism probably present in either a saprophytic or a parasitic form in all tropical cane-growing countries, and which probably has existed in them for great numbers of years past. Personally I have been acquainted with the fungus in question for over ten years, although until lately I have seldom seen it in a parasitic form. I am satisfied that in St. Vincent the main cause of the trouble is due to a great and abnormal increase of the moth borer (Diatræa saccharalis) during recent years, as in ninety-five cases out of a hundred the attack of the fungus may be clearly traced to the tunnels of the larvæ of the moth borer, whilst in the remaining cases the fungus has attained access either through mechanical injuries to the stem of the cane, through injuries caused by the removal of dead or dying leaves from the stalk before they are quite ready to fall off, or through abrasions of the surface of the leaf caused by attacks of acari, etc., or by the force of the wind. The great increase in the numbers of the moth borer has resulted in enormously increasing the feeding area open to the rind fungus, and as a direct consequence, has greatly increased its abundance, whilst the repeated attacks of the moth borer must have lessened the vitality of the cane and so rendered it more liable to succumb to the attacks of the fungus. It is not saying too much that on certain estates in St. Vincent the fields have been literally invaded by the spores of the fungus ready to find a resting place on any injured surface of the stem or leaves of the cane. At the same time the fungus Tricosphæria saochari, doubtless originally and still in many sugar cane producing countries a saprophytic fungus, has gradually assumed a parasitic habit from the exceptional opportunities offered to it during recent years of growing in the interior of the sugar cane by means of the tunnels of the larvæ of the moth borer.

6. My advice, therefore, is that every effort ought to be made to lessen the numbers of moth borer, and experience has shewn that this can be done by cutting out all the canes showing any signs of attack during the *earliest* stages of their growth. The canes thus cut out ought either to be burnt or else split open and the larvæ of the moth borer removed. The latter plan is a most efficacious one, if the labourers employed on this work are paid according to the number of larvæ collected by them. If the cutting out is done during the earlier stages of the growth of the cane the number of canes produced per acre will not be reduced, but probably increased, as from the underground eyes of the cut-out cane one and probably more canes will spring. The practice of steeping the cane tops before planting in a solution of either carbolic acid, Jeyes' fluid or similar coal tar preparations made in the proportion about one pound of the preparation to twenty gallons of water, is one highly to be recommended as tending to destroy any larvæ of the moth borer present in the cane-tops, and also as tending by the smell remaining on the tops after soaking to prevent the moth borer, depositing their eggs upon the young plants whilst first springing. The use of milk of lime for the same purpose may be recommended, but in my opinion this will not prove so efficacious as that of the coal tar preparations. It is worthy of note that the lower qualities of carbolic preparations containing napthals and heavy tar oils are probably the most efficacious for this purpose. Insectivorous birds ought to be protected with a view of decreasing the number of the moth borers, whilst ground lizards, etc, ought not to be destroyed.

7. Unfortunately, where the fields have been already attacked by the fungus the only remedy lies in reaping the canes as soon as possible after the attack has been noticed, the loss resulting from the canes not being fully ripe, being far less than that which will ensue if the canes are allowed to stand and the disease to run its course. Every dead and badly-diseased cane ought to be removed from the field and destroyed by fire, preferably in St. Vincent by passing them through the mill and burning the megass, the juice being raised to the boiling point, and afterwards either used for the manufacture of rum or run to waste.

8. I cannot recommend the burning of all the trash upon fields affected with rind fungus as I believe that the result of such a proceeding especially if repeated, upon soils already deficient in retentive power for moisture, would be most disastrous. Doubtless the practice would lessen the number of moth borers to some extent, and also that of the

spores of the fungus, but its final result must be, even if it eradicated the moth borers and fungi, which is not likely, to eradicate the canes themselves. Several instances of the very great injury which may be done to light soils, by the burning of all the trash where the conservancy of the organic matter of the soil is of prime importance, were brought to my notice during my visit to St. Vincent.

9. As I ascertained that a few managers and proprietors do not adopt any precautions against the spread of moth borers and rind fungus, and as their not doing so tends to materially invalidate the beneficial effects which should be produced by the efforts of those adopting the necessary precautions, I consider that in an Island like St. Vincent, where the general interests of the inhabitants are imperilled by the lack of action of a few, legislative action is desirable to compel all proprietors to exercise all reasonable precautions for this purpose.

10. Certain planters in the Colony are apparently inclined to justify their lack of action in this matter by their belief in the alleged "degenerescence" of the bourbon cane, and to do nothing until some variety of cane is discovered by someone else which is borer proof, disease proof, capable of resisting all climatic and cultural defects, and of producing maximum crops of sugar with the least possible attention to cultivation and manuring. As it is not likely that such a desirable combination will be found in the immediate future, it will be as well for these gentlemen to disabuse their minds of their belief in the degenerescence of the bourbon cane and to search carefully through their modes of cultivation for the defects therein which have led to the bourbon cane succumbing so readily to the combined attack of the moth borer and rind fungus. As long as the cane is in a thoroughly healthy condition it is able to protect itself against the injuries caused by the larvæ of the moth borer by the formation of a woody layer surrounding the tunnels of the larvæ, but when it is not in a condition to do so the spores of the rind fungus attain easy access to the soft interior of the cane, and when anything takes place which reduces the vitality of the plant, the canes exhibit what is now recognised as an attack of the rind fungus.

11. As far as I have been able to ascertain, the causes which tend to lower the vitality of the canes are principally the approach and occurrence of the flowering period, the withdrawal of the necessary supplies of water through drought, and the repeated attacks of the moth borer. Of these I am inclined to consider the second as of most importance. Where the soil is in "good heart" and properly retentive of moisture the

short droughts which occur near to the ripening period of the growth of the cane do not injure the plant, but on the contrary are beneficial to it. Where the soil is deficient in retentive power the cane becomes materially weakened and in consequence succumbs to the attack of the ever present fungi. There is no greater danger to the health of plants in the tropics than the adoption of garden cultivation, as has been done in St. Vincent, Barbados and Antigua, in cases where what the gardener regards as the backbone of his system, viz: heavy manuring with dung and pen manures, is neglected, and I do not hesitate to state that this system has been followed on some estates in St. Vincent with the inevitable result that the crops have fallen off and the canes appear to suffer from constitutional weakness.

12. On a few places, and notably on Argyle Estate, I noticed canes which appeared to be attacked by the modification of Tricosphæria sacchari which apparently produces the disease known as "root fungus" in Barbados. Where this is the case I consider that the land should be fallowed from cane cultivation for a time, leguminous crops being grown instead, and that when replanted with canes it should be with a variety such as the white transparent or burk seedling instead of the bourbon.

13. At the present time much is being said about the substitution of other varieties of canes for the bourbon, this substitution being regarded by some persons as a panacea for all evils which affect the sugar cane. In St. Vincent, on the very lightest soil, where the bourbon seldom yields well, white transparent canes might advantageously be substituted for the bourbon, but I cannot recommend such a substitution where the bourbon in average years have yielded satisfactorily. Wholesale substitution of the white transparent under any of its synonyms *must* result in reducing the average crop of the island, whilst the retention of the bourbon on such soils as are favourable to its growth *may* in unfavourable years result in lower yields than if the white transparent had been universally adopted. As I found in St. Vincent all the more common varieties of canes growing on the fields planted with the bourbon, for instance the creole cane, the purple and white transparent canes, the red and white ribbon canes, it is evident that the question of varieties has at some previous period attracted the attention of the St. Vincent planters, with the result that the bourbon appeared to be the most suitable. At the same time it is advisable for the Government Botanist to grow experimentally new varieties of seedling canes,

14. The manufacture of sugar in St. Vincent is, in my opinion, in a most deplorably backward state; the crushing power of the water mills is generally very deficient, whilst apparently, as a rule, but little attention is given to the regular feeding of the mills, or as to whether the rolls are fed with canes or with a mixture of canes, cane-tops and trash. In the boiling houses but little care seems to be taken with the clarification of the juice, and as a consequence the sugar produced is of low quality. The points which require attention in order to increase the yield of the sugar from the canes under the present disadvantageous circumstances are, that: 1st. Great care should be exercised in cleaning the canes from adherent trash and leaves. 2nd. The canes ought to be topped just below the adherent leaf sheaths at the top, instead of as is frequently the case just above them. 3rd. Every care must be used to ensure the regular and continuous feeding of the mills. The freedom of the canes from adherent leaves and trash will tend to increase the extraction of the juice, the trash necessarily causing an increased re-absorption of it during the crushing, and to improve the colour of the expressed juice. The portion of the cane covered by the leaf sheaths contains but little crystallisable sugar and much glucose and "gums," so that crushing this with the rest of the canes results in actual loss of sugar and in increase of molasses. Regarding the regular feeding of the mills, I would suggest that two men ought invariably to be employed in feeding the canes so as to get as even a feed as possible; the increased extraction will far more than repay the outlay. I mention this point especially as I noticed several mills which, although small, were of excellent proportions, and which, if properly fed, were capable of a far higher extraction than they were giving.

15. The planters of St. Vincent are handicapped by the fact that the Colony is too small to justify the appointment of a resident Chemist, and that there is not any person resident in it who possesses the requisite knowledge to make accurate determinations of sugar for them. The means of bringing the more immediately necessary assistance in this direction to the planters have received very careful consideration, and I suggest that Mr. Powell, the Government Botanist, should be allowed to receive instructions in the examination of sugar products and be supplied with the necessary apparatus. During my visit to St. Vincent I formed a high opinion of Mr. Powell's abilities and energy, and I believe that the adoption of this suggestion would result in much benefit to the sugar industry of the Colony.

16. I am of opinion that in certain districts the erection of factories with modern appliances for the treatment of canes in the manufacture of sugar, would pay during years of average prices, but in years when prices are low, as at present, I do not think that the erection of factories capable of making less than four thousand tons per annum would be of any advantage. The only district in which a factory of this size could be worked is, in my opinion, the Carib country. The advantages gained by treating the canes in a central factory with modern appliances would be, an increased extraction of juice, an increase in the proportion of merchantable sugar obtained from the juice, and the higher values of the products obtained. Owing to the very economical working of factories using water power for crushing the canes, I do not think that any reduction in the manufacturing expenses per ton of sugar produced would result, but probably the cost per ton would be increased by the salaries necessarily paid for the central and scientific supervision of the factory. I estimate that at present the extraction of juice from the cane in the Carib country factories does not exceed as an average 58 per cent. of the weight of the latter, whilst with improved modern mills a yield of at least 72 per cent. of normal juice would be obtained. The recovery of merchantable sugars with the improved appliances would not be at a less rate than 88 per cent. of the amount of crystallisable sugar indicated as present by polariscopic test, whilst I doubt if at present as much as 82 per cent. is recovered in the form of low grade muscovado sugar. The important question is: Would, at present prices, the difference in value between the products of a factory using modern appliances and of those now obtained in the somewhat primitive work in St. Vincent, be sufficient to pay the interest on the additional capital required for the erection of the factory and the necessary tram lines, etc.? If we assume that in average years, under the present system, the Carib country estates (Turema, Orange Hill, Waterloo, Estate Lot No. 14, Rabaka, Langley, Park, and Mount Bentinck), are capable of producing 2,500 tons of muscovado sugar, we may safely estimate that a factory capable of producing 4,000 tons would be requisite under the improved conditions of cultivation, etc., which would result from its establishment. At a fairly low estimate I believe that the cost of such a factory with its necessary appendages, would amount to £50,000 which would require an increased return of £7,500 per annum to cover interest on the capital and depreciation of the plant. From reasons already given I am of opinion that

the cost of manufacture per ton of canes would not be appreciably lessened from its present price, 2,500 tons of Muscovado sugar at present prices would be worth locally £16,250 or £6 10s. per ton, The yield of molasses on the St. Vincent estates will probably amount to eighty gallons per ton of sugar produced, worth locally perhaps 5d. per gallon, and the value of the total yield would be approximately £4,150. The total value of the produce under the present system would then be £20,400. If the central factory made non-chemical sugar (grey crystals), the yield approximately would be increased to 3,330 tons, of which probably 500 tons would be molasses sugars. 2,830 tons of grey crystals at say, £8 10s. per ton would be worth £24,050, and 500 tons of molasses sugar at £6 per ton would be worth £3,000, whilst the yield of molasses, probably at the rate of 40 gallons per ton of crystals at 2½d. per gallon would fetch £1,600. The total value of the products made at the factory would then be £29,650, or an increase of £9,250 on the value of the muscovado products. Allowing £1.000 per annum for the cost of scientific, technical and chemical central, it appears that even under present conditions of the sugar market, a factory capable of producing 4.000 tons of sugar could be carried on with some profit. In these assumptions I have purposely taken the lowest results likely to be obtained in practice. If on the contrary I had assumed, as was recently done in Barbados by the sub-committee of the Executive Committee appointed to investigate the subject of the erection of central factories in that island, that the results which would be obtained would be equal to the highest ever recorded in any cane-producing colony irrespective of local variations in the composition of the canes, I could have easily produced figures showing that relatively enormous profits would ensue by the erection of a central factory in the Carib country. It is however worth calculating what the pecuniary results might be if sugar of higher grade than grey crystals, viz:—Yellow or Demerara crystals, were produced. We may assume that the yield of yellow crystals under favourable conditions of working might amount to 95 per cent. of that of the grey crystal and that the yellow crystals would be worth £10 per ton locally. In this case the value of the products would be about £32,400, or an increase of about £12,000, thus showing a gain of £3,500 on the value of the products produced at the Central Factory. Taking into consideration that the manufacture of sugar in St. Vincent is at present in a most backward condition, I am of opinion that the

erection of a central factory to make about 4,000 tons of sugar per season would be advisable in the Carib country, and would probably pay considerably more than the interest on the additional capital invested.

17. In connection with the erection of a central factory in the Carib country, I may point out that by taking advantage of the streams draining the Morne Garou and Souffriere districts which flow to the eastward, a system of irrigation might be arranged for the Carib country estates which should ensure the production of exceptionally heavy crops of sugar cane upon them. This of course entirely depends upon the substitution of a central factory for the present ones worked by water power.

18. The general opinion which I have formed regarding the sugar industry in St. Vincent, is that it is in a most critical condition, a condition accentuated by the great prevalence of the moth borer and of fungoid diseases, and at the same time largely brought about by the misdirected economy exercised during recent years in the agricultural management of many of the sugar estates. On the other hand I am satisfied that St. Vincent ought to be able to produce a somewhat limited quantity of sugar at a cost of production as low as or possibly lower than is attained elsewhere in the West Indian Colonies. This can only be brought about by united action directed against the moth borer and the rind fungus, by restoring to the soil a power of retention of moisture and by judicious manuring. More care must be exercised in the directions I have indicated to obtain the best possible results with the present machinery, and if possible, a central factory, accompanied by a scheme of irrigation, should be erected in the district known as the Carib Country.

Mr. Quelch mentioned that the "Annals of Natural History" for August, contained descriptions of two new spiders, *Cyrtogrammomma monticola* and *Aysha Quelchii*. Both of these had been collected on the top of Roraima, and it was interesting to note that all the invertebrata collected in the late expedition were new. Further and longer explorations were most urgently required so that more might be known of this interesting fauna.

Mr. Quelch exhibited a medal which he had just received for his services in connection with the working out of the Reef Corals for the "Challenger" reports.

The meeting then terminated.

Meeting held October 10th.—Hon. E. C. Luard, President, in the chair.

Members present 13.

Elections.—*Members:* Dr. Macnamara, Messrs. E. R. Forshaw and G. S. Munro.

Associates: Messrs. H. Brassington, J. P. Gordon, Richd. Bishop and T. H. Harrop-Williams.

The following gentlemen were proposed by the Directors as Corresponding Members, to be ballotted for at next meeting:—

Mr. William Fawcett, Jamaica; Mr. J. H. Hart, Trinidad; Mr. J. R. Bovell, Barbados.

In the absence of Mr. Æneas D. Mackay, his notice *in re* Columbian Medals and Diplomas was allowed to lapse.

The President informed the meeting that at the request of the Board of Governors of the Institute of Jamaica, the Directors had given permission to Mr. Quelch to forward on loan some of the duplicate specimens from the Museum for a proposed Exhibition of Arawak Remains, in connection with the opening of the new Museum buildings at Kingston:—

Kingston, Jamaica, 23rd September, 1895.

Dear Sir,—Enclosed I have pleasure in forwarding you a circular relative to the Anthropological Exhibition to be held in the New Museum of the Institute of Jamaica. Mr. Fawcett, Director of Public Gardens and Plantations, and one of the members of the Board of Governors of

the Institute has informed us that you will probably be able to render us some assistance.

The Board of Governors of the Institute at its last meeting, directed that I should write and ask for your kind consideration of the matter.

We shall be pleased to hear if it is in your power to lend us anything which would be of service to us in adding to the usefulness of the Exhibition.

I may mention that any specimens lent will be treated with the greatest care, and returned at the close of the Exhibition, and all attendant expenses incurred in the transmission of the specimens, paid.

I have &c.,

WM. SIMMS.
Chairman of the Board of Governors
of the Institute of Jamaica.

J. J. QUELCH, Esq., B.Sc..
Curator of the British Guiana Museum.

Museum, Institute of Jamaica,
Kingston, 7th August, 1895.

"AN EXHIBITION OF ARAWAK REMAINS."

(To include objects illustrating the life and customs of the aboriginal inhabitants of Jamaica.)

Sir,—The new Museum buildings of the Institute are now completed, and the Board of Governors proposes that the occasion should be signalized for the development of the Archæology of Jamaica.

The recent discoveries of human and other remains at Halberstadt, and of the carvings by Lady Blake at Saint John's, have awakened considerable interest in the subject in the Island, and indicate that much more may still be done, if sufficient encouragement is given. They have also brought out prominently the fact that Jamaica possesses but a very indifferent public collection of objects connected with the aboriginal Indian inhabitants. There is, however, evidence that many specimens of interest and importance are to be found in the possession of private individuals: also, that many more may probably be obtained by a thorough search in caves and other places.

The Board of Governors therefore proposes to hold a public exhibition of Arawak remains, to illustrate as far as possible, the life and customs of the aboriginal inhabitants of Jamaica, and appeals to the private possessors of such remains to help, either by the loan or the

gift of specimens. Such private donations or loans will be fully acknowledged in the exhibition, and special care given to them. The Exhibition will probably be opened towards the end of September, and continue for two or three months. It is intended to arrange special Lectures and Demonstrations on the objects.

The Board hopes that by means of the Exhibition not only will the public interest in everything that pertains to the past history of the island be stimulated, but also that a more valuable and representative collection of objects may be accumulated by the Museum, where they can be kept properly labelled and exhibited, and remain of permanent public value.

The following objects are those specially desired:—"Thunderbolts," darts, war clubs, arrow heads, stone hatchets, stone hammers, bead ornaments, Indian pottery, remains from Kitchen middens (marine shells, bones, pottery) human skulls and bones, canoes, old vessels, old coins, inscriptions, objects of worship, articles of clothing.

The Curator of the Museum will be very glad to communicate with any one having such remains in his possession, or willing to assist by searching for them. Gifts or loans will be thankfully acknowledged and, in the case of the latter, carefully returned when the special exhibition is closed.

I am, &c.,

J. E. DUERDEN,
Curator of the Museum.

Mr. Quelch informed the meeting of what he intended to forward and said he thought they might make a fair show without making the ethnological case look bare.

Mr. Scard's paper on Multiple Evaporation having been declared open for discussion:—

Mr. Vyle asked what was the object of the attempt to obtain uniform temperatures?

Mr. Scard stated that his paper shewed certain discrepancies between theory and practice, and he would like to get the opinion of engineers as to the reason of these differences.

The President said he should like to see the matter

taken up and would suggest that the discussion be adjourned to the next meeting, with a view to getting engineers to attend or forward papers on the matter.

In regard to Professor Harrison's report on the Sugar Industry of St. Vincent, the Hon. B. H. Jones said the matter of cane diseases had been discussed by the Agricultural Committee, and they agreed with Prof. Harrison that the so-called new cane diseases were really of long standing, appearing and disappearing according to climatic conditions or other circumstances.

The meeting then terminated.

Meeting held November 14th.—Hon. E. C. Luard, President, in the chair.

Members present 9.

Elections.—*Corresponding Members:* Messrs. William Fawcett, Jamaica, J. H. Hart, Trinidad, and J. R. Bovell, Barbados.

Country Member: Revd. J. B. Wallace.

Associate: Mr. R. M. M. Atkinson.

The following report of the Agricultural Committee was read:—

Georgetown, November 14th, 1895.

To the President and Members
of the R. A. & C. Society.

Gentlemen,—By direction of the Agricultural Committee I have the honour to forward five analyses of canes, which have been undertaken by the Government Chemist at the request of the Committee and in accordance with the Government regulation under which they are permitted to obtain free analyses of articles of public interest.

I have, &c.,

S. R. COCHRAN,
Secretary, Agricultural Committee.

CERTIFICATE OF ANALYSIS

Of 3 samples of Sugar Canes from Ruimveldt Plantation, marked arrowed, arrested in arrowing, and not arrowed, sent by the Agricultural Committee, R. A. & C. S., received September 23rd, 1895.

	Extraction by Mill.	Density of Juice.	Lbs. per Gallon Sucrose.	Glucose.	Co-eff. of Purity.
Arrowed	72·1	1·078	1·837	·065	90.4
Arrested in Arrowing	69·1	1·080	1·884	·119	90.6
Not Arrowed ...	74·5	1·070	1·493	·156	82·5

These results show that when arrowing has just commenced, arrested arrowing has practically the same effect that any other check to the growth of the cane exercises; a loss of water leading to a slight increase in the sugar contents. A similar series ought to be submitted in about a fortnight or three weeks' time, when probably a very different effect will be noticed from the results of the arrested arrowing.

CERTIFICATE OF ANALYSIS.

Of 2 samples of canes (Perseverance), marked arrowed, arrows dead in sheath, and not arrowed, sent by the Agricultural Committee R. A. & C. S., received October 2nd, 1895.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Purity.
Canes with Arrows projected	63·2	1·086	2·009	·113	89·9
„ Arrows dead in sheath	65·3	1·073	1·529	·156	80·9
„ without Arrows ...	64·4	1·070	1·479	·139	81·5

In this set of samples the decrease in purity of the juice of the canes with arrows dead in the sheath is beginning to be apparent. The arrowed canes yielded juice of fair quality, and which was very markedly higher in sucrose and in purity than the juice yielded, by either the canes with abortive arrows or without arrows.

CERTIFICATE OF ANALYSIS

Of 4 samples of Sugar Canes (Ruimveldt), marked without arrows, arrows just bursting, arrows dead in sheath, arrows fully projected and

blown. Sent by the Agricultural Committee R. A. & C. S. Received October 31st, 1895:—

	Extraction of juice.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Purity.
Without arrows ...	74 o/o	1·079	1·716	·156	83·8
Arrows just bursting...	68 o/o	1·083	1·856	·139	86·
Arrows dead in sheath*	69 o/o	1·084	1·931	·147	88·4
Arrows projected and blown	67·30/o	1·086	1·952	·166	87·2

The results shewn by Tests 2 and 3 are in fair agreement with those obtained with the similar samples from Ruimveldt, examined on September 23rd, but not with those sent from Perseverance.

The examinations of the arrowed canes with the arrows fully projected and blown, apparently shews the juice to have increased in sugar contents, but when the higher yield of juice (72.10/0) in the earlier sample is taken into account, it becomes clear that this is due to loss of water from the canes and not to increased production of sucrose. Thus the weight of arrowed canes which on September 23rd yielded 100 parts of sucrose in the extracted juice, now yields 99·2 parts.

With the canes which have not produced arrows, on the contrary, a considerable increase in sucrose contents has taken place, the weight of canes which then yielded 100 parts of sucrose in the juice extracted now yielding 112.2.

* Canes throwing out side shoots at top joints.

CERTIFICATE OF ANALYSIS

Of 3 samples of sugar canes attacked by Tricosphæria sacchari which attacked canes through the tunnels of the moth borer. Sent by the Agricultural Committee R. A. & C. S. Received October, 1895:—

No. 1.—Canes with all joints affected with the fungus.

Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
62·3	1·034	·395	·333	·161	44·4

No. 2.—Canes with 67 per cent. of the stalk affected.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
Affected joints.	65·1	1·043	·722	·250	·144	64·7
Healthy joints.	69·9	1·074	1·563	·192	·178	81·3
Whole canes...	66·7	1·053	1·002	·231	·155	72·6

No. 3.—Canes with 60 per cent. of the stalk affected.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
Affected joints.	56·8	1·040	·647	·208	·172	62·4
Healthy joints.	63·	1·075	1·618	·217	·115	83·
Whole canes...	59·3	1·054	1·035	·211	·141	74·6

From the above results it appears, that when canes lessened in vigour from any cause (in these cases by drought after attacks of borer) are attacked by Tricosphæria sacchari, destruction of the sugar contents ensues and as only very minute traces of alcohol could be found in the affected parts, whilst the acidity of the juice was the same in both the affected and healthy joints, that this destruction is singularly complete.

CERTIFICATE OF ANALYSIS

Of 3 samples of Sugar Canes attacked by Tricosphæria sacchari. Sent by the Agricultural Committee R. A. & C. S. Received November 8th, 1895:—

1.—Canes with 75 per cent. of the stalk affected.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
Affected joints.	59·	1·046	·497	·416	·276	41·8
Healthy joints.	62·	1·070	1·376	·178	·259	75·9
Whole cane ...	59·8	1·052	·717	·356	·280	53·

2.—Canes with 50 per cent. of the stalk affected.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
Affected joints.	60 4	1·053	·745	·384	·241	54·4
Healthy joints.	64·8	1·080	1·683	·208	·186	81·1
Whole cane ...	62·6	1·066	1·214	·296	·204	71·2

3.—Canes with 40 per cent. of the stalk affected.

	Extraction.	Density.	Lbs. per Gallon Sucrose.	Glucose.	Solids not Sugar.	Purity.
Affected joints.	61·6	1·061	·997	·333	·251	63·
Healthy joints.	65·3	1·075	1·555	·227	·170	79·6
Whole cane ...	63·7	1·069	1·329	·269	·192	74·2

The Hon. B. Howell Jones said that the analyses were of very great interest to the planter, and went on to

speak of the rind fungus, which he stated to have prevailed from Leguan to the East Coast this year. In consequence, the loss of sugar had been very great, as the fungus fed upon the juices. In addition to the actual loss of saccharine, diseased canes interfered much with the manufacture of sugar.

Mr. R. G. Duncan also spoke of the disease, which he said developed itself very rapidly, so that the increase in a few days was almost marvellous. On some estates it would take 25 per cent. more canes to make a ton of sugar on this account, which meant a very serious loss. He did not consider that burning in the field would extirpate the disease, but that the affected canes should be picked out and destroyed in the furnaces.

The President endorsed what had been said and stated that the disease was only found on the poorer soils, the richer back lands being free from it.

In connection with Mr. Scard's paper, the following notes from Mr. T. S. Cornish were read;—

Belfield, E. C., 28th October, 1895.

The Hon. E. C. Luard, President,

Royal Agricultural & Commercial Society.

Dear Sir,—In reply to your letter of the 17th instant. There is really not a sufficient base, upon which to commence a criticism of Mr. Scard's very interesting paper; he refers to this want of experimental evidence in the last clause of his paper. The Physiology of Multiple Evaporation cannot be said to be complete, in any sense, until one is in a position to make an intelligent "Heat Balance" of such an Apparatus, showing total heat expended, on the one side, and work done, on the other side. The subject of Mr. Scard's paper, is one of the most difficult points; probably any experiments, that are sufficient to solve this, will also clear up other points, such as correct ratio of heating surfaces; best velocities through tubes, in the respective vessels, the most economical volume of injection water and other points.

If proper experiments are not undertaken, no doubt these points

will be improved, by slow inductive experience and reasoning: but this method is tedious and costly.

In many Triple Evaporators, the water of condensation is passed, from 1st to 2nd vessel and thence to the 3rd, in which case ($F^2 - F^1$) and ($F^3 - F^2$) of this water, must be added to W^1 and W^2.

It is matter of experience, that in the 3rd vessel of a Triple, the upper few inches of the tubes become worn thin, whilst the examining parts are nearly as good as when new. Pipes are now commonly connected to the top parts of 2nd and 3rd Heaters, and to the main condenser; if a small flow of vapour (?) is allowed to flow through these pipes, the tubes above referred to do not suffer so severely. This indicates the presence of some gas, mixed with the vapour from boiling juice; and no doubt there is this mixture. Unfortunately there appear to be no experiments upon the rate of condensation of such mixed vapour. It is however, fair to assume that mixed vapours must obey some law akin to that of mixed liquids. If this is so, then one may expect to find the condensation of this mixed vapour from 1st and 2nd vessels, to take place between wider ranges of temperature,—somewhat as they are always found to be.

Again, circulation of juice in the 3 vessels takes place in very different manner in each. In the 1st vessel, which contains thin syrup, a constant regular flow up through the tubes and over the whole nest of tubes is the chief feature.

In 2nd vessel, the flow is less regular; the centres of quickest flow appear to wander about, and the rate of flow in these centres is quicker than elsewhere.

In the 3rd vessel, the upward flow is spasmodic; the chief centres of flow are constantly changing their positions; the rate of flow is much more rapid; but, it must be noted that the centres of quickest flow only occupy a small area of the whole nest of tubes, leaving the remaining tubes with little flow in them. These features are common to Triple Evaporators with vertical tubes, where the down-cast or return flow passage is of ample dimensions, and of course when the tube surfaces are clean.

One of the direct results of this action is, that a large area of the heating surface in the 3rd vessel, is comparatively unemployed, and that the work done by the tubes, through which is the rapid circulation, must be done at a very quick rate. How much of the heating surface could, under these conditions, be suppressed, without affecting the work done, is a question which only experiment can determine.

The foregoing may lead on to prove both why the drop in temperature, between 1st and 2nd, and 2nd and 3rd vessels cannot be the same in point of degrees, difference of temperature, and why additional heating surface, beyond a certain area, is of no use, in the 3rd vessel or otherwise of a Multiple Evaporator, when the velocity of syrup through the tubes is sufficiently rapid.

So far as my experience goes, direct circulation gives the best result per square foot of heating surface, *i.e.*, where each heater is divided into two or more divisions, and where the syrup passes only once through each series of tubes. Any required velocity can be secured in this way, with the certainty that there may be no idle surface upon which scale could accumulate.

Permit me to say, that I do not think experiments will prove to be of much value, unless more than two competent persons join hands for the purpose; and when one bears in mind that the usual work of any Factory must not be upset, it will be understood that a good deal of forethought and care will be necessary, to conduct any successful experiments.

Mr. Scard being unable to attend had written the following, which was also read:—

Sir,—Mr. Cornish confirms my remarks on the want of experimental evidence in connection with Multiple Evaporation, but from the last paragraph he evidently thinks that the chances of obtaining this here are small, interference with work of Factory, and want of technical assistance, tending to enormously increase the difficulties of experiment. There is a good deal of truth in this, but I fancy, and it is my experience, that a little organization will obviate the former while there is sure to be found among the hands employed some one sufficiently reliable and intelligent to render valuable assistance, especially if the system of experiment is persevered with. The great difficulty lies in appropriation of the busy hours of the well employed Engineer to work of this description, especially when only holding a visiting appointment.

In alluding to the modern practice of taking the Calandria Water through all the vessels, Mr. Cornish has fallen into error as to the calculations involved. The emerging water of condensation comes out of the third Calandria *not* at the Temperature of the third vessel, but near to that of the second in the case of a triple effect. Thus, if the

temperatures of the steam employed, and if the three vessels were respectively 220° F, 205° F, 180° F, and 126° F, the Calandria Water taken from the third Calandria would be close to 180° F, and not 126° F. This I have found to be invariably the case when experimenting on the quantities of Calandria Water yielded. In fact, the water does not remain long enough in contact with the condensing surface to have its temperature lowered to that of the other side of the tubes. This is an important point as the advantage claimed for this method of dealing with the Calandria Waters is thus much reduced.

While recognising the conditions of boiling in the various vessels to which Mr. Cornish alludes, I do not think that any heating surface in the 3rd vessel is rendered inoperative thereby. Certainly, as regards the temperature differences, these are not influenced by them to any extent. I have come into contact with Multiple Effects of all designs of circulation, from the old centre circulating tube to the modern Calandrias of Messrs. Chapman, Harvey and others, and differences of temperatures to which I have drawn attention, occur in each.

As to future investigation, the information most particularly wanted is the relations of the several Calandria Waters to the total Evaporation under varying conditions of heating surfaces, densities, etc, and I hope that before long this information will be forthcoming. The results which I have myself obtained on these lines point to most interesting facts being thus brought to light, and I am sure, that with co-operation, vexed and important problems connected with Multiple Evaporation would be satisfactorily and profitably solved.

The thanks of the Society were accorded to Mr. Cornish.

Mr. Quelch called attention to a fine specimen of the Golden Eagle which had been presented to the Museum by the Hon. Gilbert Irby, for which the Secretary was directed to convey the thanks of the Society. He also exhibited the head of a deer shot lately on Pln. Enmore, which differed from any species hitherto recorded from the Colony. As, however, only the head had been preserved, he had been unable to identify it.

The President called attention to the fact that the

Annual Elections of Office-Bearers would take place at the next meeting.

The meeting then terminated.

Meeting held December 19th.—Hon. E. C. Luard, President, in the chair.

Members present 25.

Elections.—*Members:* Revd. L. Crookall and Mr. Lloyd Dornford,

Associates: Messrs. C. H. Bagot, W. Cunningham, Jnr., M. H. Bugle, R. A. Reynolds, W. H. McGowan and R. Belgrave.

Communications were read from Messrs. J. R. Bovell and J. H. Hart thanking the Society for electing them Honorary Members, and J. E. Deurden for loan of Indian Curios from the Museum.

The Hon. B. Howell Jones brought forward a paper by Prof. Harrison which had been read before the meeting of the Society of October 1894, and laid over. It had been recommended for adoption by the Society as their Official Standard Method of Polarisation of Sugar, and Mr. Jones moved that it be now adopted :—

It is well-known that polariscopes of the Soleil-Duboscq, of the Soleil-Scheibler-Ventzke, of the Schmidt & Haensch Shadow, and of the Laurent ordinary light construction, when used at tropical temperatures with solutions made by dissolving the makers' normal weights of chemically pure sucrose to a bulk of one hundred cubic centimeters, never, if correctly adjusted by the makers at a normal temperature of 17.5 deg. C. (63.5 deg. F), give readings of 100 deg., but readings varying from 99.6 to 99.78. That is, that working with these instruments in the exact manner laid down by their makers, but at temperatures of about 86 deg. F. instead of about 60 deg. F., the instruments show from ·3 to ·4 of one per cent less than the true sugar polarisations. In consequence, a sugar which polarises 96 deg. when examined at the normal

temperature for which the instruments are constructed, will, if normal weights are made up to normal volumes at our prevailing temperature (temperature being the only factor varying) polarise only about 95.7. These instruments all show the sugar percentages by means of quartz plate compensators.

In instruments using monochromatic light (the light from a flame coloured by sodium) and in which the readings are obtained by the rotation of the analyser, the readings of a sugar showing 100 deg. when tested at 63.5 deg. F. give only 99.85 at 86 deg. These errors arise from two causes:—

1st. The rotatory power of quartz for light increases with the temperature, thus requiring a greater weight of sugar to produce a definite degree of rotation at high temperatures than at low ones.

2nd. The rotatory power of sucrose solutions decreases slightly by rise of temperature (irrespective of changes of volume,) and this has the same effect upon the polariscope indications.

In addition to these which are the primary causes of error, some instruments are furnished with metal scales which by their expansion add very slightly to them.

The effects of these errors can easily be calculated, but owing to the factthat the rotatory power of quartz is not absolutely invariable in different specimens, it is far preferable to standardise the polariscopes under the exact conditions in which they are to be used, than to apply calculated corrections.

(I may here mention that I believe that the Laurent instruments are standardised by the maker at 4 deg. C. (39.2 F.) and in consequence the errors arising from using the normal weight of 16.2 grams at our temperatures become very marked.)

It has been my practice, whilst I have been in the West Indies, to standardise all the measuring instruments used to true cubic centimetres, and to set the polariscopes by ascertaining either the necessary corrections or the true normal weights by the use of solutions of chemically pure sugar. The late Mr. Francis invariably used the same method, and it is that used by certain of the more highly qualified technical chemists in this Colony.

Recently some polarisations have been made here using the normal weight for a Ventzke instrument at 63·5 deg. F. and a flask containing 100 Mohr cubic centimetres *i.e.* 100 grams of water at 30·C. (86 deg. F.) instead of our holding 100 true cubic centimetres, this resulting in sugars

so polarised showing ·6 of one per cent lower than duplicate samples examined by the Government Analysts. As a result of this, I have been informed by one of the leading firms of sugar exporters that "under your system the purchaser here must necessarily be the loser." As a matter of fact, the system adopted at the Government Laboratory is the only one by which samples of the same sugar examined in different instruments, by different observers and at varying temperatures, could give identical results, and, as a necessary consequence, it must be absolutely fair to both buyer and seller. When the normal weight of 26·048 grams is taken and made up to 100 cubic centimetres and examined at our temperature, in a Schmidt & Haensch instrument correctly adjusted at 17.5 deg. C., then the result is that the seller is the loser to the extent of ·35 of one per cent; whilst if the solution is made up to the volume occupied by 100 grams of water at the temperature prevailing here, he will be the loser to the extent of rather more than ·6 of one per cent.

The point upon which I consider that it is desirable for the Planters' Association to express an opinion and definitely settle with regard to the basis upon which sugar tests are to be made here is:—

Does a polarisation of 96 deg. mean that a sugar indicates 96 deg. in the polariscope when tested in such a manner that a sugar containing 100 o/o of sucrose will indicate 100 deg.?

Or does it mean that it is merely a reading of 96 deg. when sugar is tested by dissolving the maker's normal weight for the instrument used to 100 c.c. in which case results varying from 95·2 to 95·9 may be obtained by examining a sugar correctly polarising 96 by means of the various instruments at present in the Colony which have come under my observation?

Or are you willing to accept a further deduction from the true polarisation of ·3 of one per cent. by the use of flasks holding 100 grams of water at 86 deg. F. instead of 100 true cubic centimetres?

In other words is the standard to be 96 as it has been up to the present, or a varying one of from 96·1 to 96·8 according to the instrument used, or, still more objectionable, of from 96·4 to 9·71 when in addition to the instrumental errors, a flask graduated on a wrong system is used.

This should be definitely settled, and all chemists polarising sugars here for commercial purposes be required to examine the samples submitted to them in accordance with the method adopted by your Association.

As an illustration of the varying results which may be obtained by examining sugars by different instruments, using in each case the normal weight for a temperature of 63.5 deg. F., I may mention the following obtained in the Government Laboratory with a sugar testing correctly 96 and using the various instruments in my possession.

Instrument used.	Normal weights taken.	Result.
Soleil Ventzke Scheibler (Instrument used by Mr. Francis)	26·048 grams	... 95·7
Schmidt and Haensch (specially corrected instrument made for the Govt. Laboratory)...	„	... 95·88
Schmidt & Haensch (not corrected) ...	„	... 95·65
Laurent Sodium light	16·3	... 95·9
Laurent White light	„	... 95·6

At the present time the errors incidental to the use of polariscopes at temperatures other than the standard for which they are originally constructed, are fully recognised in the United States, and a special system of correction is in use in the Custom House Laboratory, and was also employed in the Laboratory in which the Bounty was assessed. Each instrument used is supplied with a set of standard quarter plates, and with tables shewing the sugar value of each of them, (in terms of Ventzké degrees) at various temperatures. The instruments when used are set by one of these plates, and a correction applied to the reading corresponding to the recorded value of the quartz plate used at the temperature of observation.

Thus in the case of a sugar polarising about 96 deg. the instrument would be set by means of a quarter plate having a value of about 96 deg., say in this case of 96.5, at 17.5 deg. C. The temperature, for example, is found to be 28 deg. C, by reference to the table the sugar value of the quartz plate is seen to be 96·8, an addition of 3 is then made to the observed readings of all polarisations of sugars approximating to 96 deg. examined at the same temperature and at the same time.

I have been informed that such a cause is not recognised in Germany. Possibly this may be, so as during the sugar making season the temperature will not be at any time much above the standard of 17.5 deg. C. At the same time as such authorities as Landelt specially draw attention to the variation in the rotatory power of quartz, caused by changes in temperature and give corrections to be applied to the polarisations of sugar solutions for such changes, I feel certain that when

accuracy is desired these temperature effects are fully recognised and allowed for.

As the range of temperature here is not very great, I consider that the method used in the Government Laboratory for the last fourteen years is the best. Each 100 cubic centimeter flask in use for sugar polarisations is verified by weighing into it 99.533 grams of recently boiled distilled water at 28 deg. C. The exact weight of chemically pure sugar, which when made up to a bulk of 100 cubic centimeters in one of the corrected flasks at 28 deg. C. gives a polarisation reading of 100 deg. is ascertained by experiment for each instrument and this weight of sugar is invariably used instead of the makers' normal weight for 17.5 deg. C.

Mr. R. G. Duncan seconded, at the same time asking that it should be brought up again at the next meeting, after republication. This was agreed to.

The President gave the following valedictory address before proceeding to the election of Office-Bearers for 1896 :—

Gentlemen,—In accordance with time-honoured custom, I propose with your kind permission to say a few valedictory words before vacating the Presidential chair of this Society, which I have had the great honour of occupying during the year now drawing to a close.

Gentlemen, I wish I could think that at the end of 1895, more interest was being taken in the work of this Society, than was the case at the beginning of the year. Our worthy Vice-President said last year that he considered this Society the most important Society in British Guiana, and one, which if it fulfilled the objects for which it was founded as far back as 1844, ought to leave some foot-prints on the sands of time, in connection with the history of the progress and development of this great colony. We cannot doubt, nay we know, that it is doing so, but Gentlemen, while there are not a few who take a great interest in the Society and give practical proof of their interest in it, there are a large number who I fear do not, and when we think how greatly the Society's sphere of usefulness might be extended were more to come forward, interesting and identifying themselves with its transactions, it must continue a matter of lasting regret, as long as the Society, outside its library and periodical association, is not more popular. It has been said (and I believe it) that everything comes sooner or later

to those who know how to wait, and we can only trust that as the Society grows older it will become more and more known, more and more useful, and more and more popular in the best sense of the word :—

Floreat Guianensis Britannicæ Societas Regia, Agrestis et Negotialis!

Gentlemen, when I had the honour of addressing you at the beginning of this year I felt it to be my duty to refer briefly to the dark cloud which was then passing over the Colony, and I ventured to express my conviction that the storm would be weathered and the staple industry of the Colony again enjoy a reasonable share of prosperity. I hardly dared hope that before the close of 1895 we should see what there is reason to believe is the beginning of the passing away of the dark cloud I referred to, but I do think that we may now believe this to be the case, and while those connected with the sugar industry still have cause to feel grave anxiety, the sugar industry nevertheless is in a somewhat better position than it was at the beginning of the year, and consequently, notwithstanding the bad season through which we have just passed, all those connected with sugar in British Guiana are more hopeful than they were a few months ago, and we may well feel satisfied and thankful that it is so.

On the 14th November, Mr. Chamberlain received at the Colonial Office one of the largest and most influential West India Deputations that ever waited upon a Colonial Minister. Mr. Nevile Lubbock—this Society's Resident Director in London—explained the present unsatisfactory condition of the Cane Sugar Industry, declaring that it was a great injustice that such an industry should be governed by the Legislation of Foreign Countries. Mr. Nevile Lubbock strongly urged that Mr. Chamberlain should induce Her Majesty's Government to encourage the negotiations now going on between Foreign Powers for the mutual reduction and abolition of Bounties. Finally, Mr. Chamberlain promised to communicate with his colleagues as to influencing the negotiations now going on between Foreign powers.

The next subject I wish to touch on, Gentlemen, is in connection with the local cultivation of rice. At the monthly meeting of the Society held on the 8th August last, I brought forward a letter, which had been addressed to our Vice-President, Mr. R. G. Duncan, by the Editor of the Louisiana Planter, referring to the rice industry of the Southern States, and I venture to believe that it is due mainly to the interest then taken by this Society, and to the discussion which took place, that

the powerful movement which is tending towards the formation of a rice-growing Company became an accomplished fact. You are all aware how many planters and others have come forward offering valuable assistance and suggestions, you have read the report of Messrs. Menzies and Brassington as to the most suitable lands in the Colony for rice growing operations, and are aware of the present position of affairs. Coupled with this position I would express my conviction of the obligation this Society is under to the Hon'ble Arthur Weber, Chairman of the Committee for the proposed Rice Company, for the indefatigable interest he has taken from the first in the whole movement.

Rice is being extensively grown on a small scale by coolie farmers throughout the Colony, and one cannot but be struck by the evidences of their industry in this direction, which may be seen all over the Colony, and particularly in Essequebo and Berbice. The growth of rice is steadily increasing, and it is to be hoped that this product, after supplying local wants, will soon form an item in the list of the colony's exports.

In referring just now to the proposed Rice Growing Company, I did so, not so much because it is likely in itself to prove an excellent thing, the conception of which was worthy of this Society, but because I hope it clearly indicates that more interest is being shewn by the people in matters appertaining to agriculture, and that the agricultural resources of this Colony are now better realized and valued than has ever perhaps been the case before in its history, and I trust, and feel sure, that future Presidents of this Society will not let the great interest now being manifested die out from want of encouragement and support.

I cannot quit the subject of agriculture without briefly referring to the report of the recent Commission on the *development of Minor Industries.* The report is dated the 10th July last, and the conclusion and advice offered therein are very valuable. The Commissioners reported that rice, coffee, cocoa, kola, and tobacco, are products the cultivation of which would result in such great advantage to the Colony that they might be encouraged by the Government, and they draw particular attention to rice and tobacco by reason of the comparative shortness of the time required between planting and harvesting. Finally, the Commission recommended to the Executive Government that the sanction of Her Majesty's Principal Secretary of State for the Colonies be obtained for the raising of a loan not exceeding $1,000,000, to be advanced, under

approved security, for the purpose of assisting Minor Agricultural Industries in the Colony, and they were of opinion that Minor Industries may very properly be fostered by increasing the import duties on rice, cocoa, coffee and corn. If there be any here who have not had before them the report of this Commission in question, bound up with which is the report of the special Commission on the Banana Industry, I beg leave to advise them to procure it, as it is full of interesting agricultural matter, and well repays careful perusal.

The Annual Horticultural Show was duly held in the Promenade Gardens on the 29th August, the arrangements for which were entirely satisfactory and as an exhibition fête (to quote from Mr. Quelch) it passed off without a hitch. No less a sum than $418, was awarded in prizes, and but for the counter-attractions of the Cricket Match, the number of visitors to the Show would have been even greater than it was. The value of these Annual Horticultural Exhibitions cannot be over-estimated, and this Society will doubtless continue to do everything in its power to foster and encourage them.

During the year important papers have been read at the monthly meetings of the Society, hearty votes of thanks in each case being accorded to the gentlemen who had so kindly come forward and given the Society and the public generally the results of their researches and experience. The papers, which have attracted much notice and attention both here and elsewhere were as follows :—

1. A paper on Cane Cultivation in the Straits Settlements, by Mr. Campen.

2. A paper on Food Adulteration, by Mr. Luke M. Hill.

3. A paper on the Relation of Boiling Temperatures in Multiple Evaporation by Mr. F. I. Scard.

4. Mr. T. S. Cornish's reply to the latter; and last but not least, Professor Harrison's analyses of canes in various stages of abnormal growth, and those attacked by the rind fungus, which during the past year has been so fatal in its results in many districts of the Colony, and which at present is so little understood.

I may mention that within the last few days a paper on Multiple Evaporation has been received from Mr. Price Abell, which will come before the Society in due course.

Turning to the library department of the Society you will be interested in hearing that since 1888 the number of books has been increased 50 o/o, there being now about 19,000 volumes on the shelves.

In the Museum, many interesting additions have been made by purchase, presentation, and exchange; objects illustrating the natural history, mineralogy and ethnology of British Guiana.

With regard to *Timehri*, it continues to maintain its high standard of excellence, the Editor however would gratefully acknowledge more papers from members, as he finds it frequently very difficult to supply copy for the printer.

Among those who have gone to "that bourne whence no traveller returneth" I may specially mention Mr. H. Ledoux, an old member, Mr. W. H. Gladwin, the Revd. S. Manning, and Miss N. Waby lady subscriber; and we have to regret the well earned retirement from our Colony after many years residence, of Mr. T. H. Glennie, and the Hon'ble W. H. Sherlock, Directors and members of Committees, also Mr. W. S. Marr, member of the Agricultural Committee.

Gentlemen, I have to thank you all for your courtesy towards me during my term as President, and the Hon. Secretary, Hon. Treasurer, and the Assistant Secretary and Librarian for the kind and ready assistance they have always afforded me.

I am sure that it is a matter of deep regret to us all that Mr. Conyers is not with us here to day, and we shall warmly welcome him back to his accustomed seat. Mr. Conyers has always been a valued and indefatigable Honorary Treasurer, and takes deep interest in the Society. May his invaluable services long be spared to it.

It has been the privilege of the retiring President to submit for the approval of the members the name of the gentleman proposed as his successor, and if there were anything required to augment the pleasure I have derived from this Society during my term of Presidency the announcement I am enabled to make, would a great deal more than suffice.

Gentlemen, you will feel both proud and satisfied when I inform you, as I have now the privilege of doing, that our acting Governor has most kindly permitted himself to be nominated for election as President of the Royal Agricultural and Commercial Society of British Guiana, for 1896.

Gentlemen, as I have ventured to tell His Excellency, I apprehend with certainty that all who have the welfare of the Colony, and this Society at heart, will be intensely pleased, and the motive power of this pleasure will be the feeling that His Excellency's gracious acceptation of and election to the President's chair, offers a guarantee for the continued welfare and prosperity of this Society, which perhaps no

other action and no other circumstances could to anything like the same extent have brought about. Anything more—and I could easily add to what has just passed my lips—would perhaps appeal less eloquently and less fervently to you than silence, and therefore Gentlemen, it only remains for me to propose—with great satisfaction in behalf of the Society and with a deep feeling of the honour—that His Excellency our acting Governor be elected President of the Royal Agricultural and Commercial Society of British Guiana for 1896, and may he long be with us.

His Excellency the Acting Governor, having been seconded for the Presidency of the Society by Mr. R. G. Duncan and elected with acclamation, spoke as follows:—

Mr. Luard had said in his valedictory address that everything came to him who waited; but with regard to the gracious act they had just performed, and the unlooked-for, unexpected and he was afraid to say undeserved honour they had conferred upon him, he could assure them that it was not waited for by him. It was unexpected, and unsought, so they would quite understand that it took him by surprise. But whilst taken by surprise, at the same time it afforded him the keenest pleasure to feel that so great an honour could be paid to one who had been amongst them so short a time. During that short time he hoped the words that had fallen from him, if not the deeds he had done, had shown them that he had the interests of the Colony and the general community thoroughly and entirely at heart. To further those interests had been his honest endeavour, and whilst he remained amongst them it would always be his earnest and honest endeavour to continue to do so. About the great compliment they had paid him his heart was too full to express in words what he felt; but it was a compliment which would bind still closer about his mind and heart those ties which now bound him to the Colony. That so important a Society should have elected him as its Presidcnt after so short a stay amongst them would constrain him to record that day as one of the red-letter days of his life. To fulfil the presidential duties as they had been fulfilled in the past, and especially during the past two years, he could not hope, but if honest endeavour and earnest striving could do anything to further the Society's interests, they might be sure that that endeavour and striving would be made by their humble servant who was addressing them, The

Chairman had said in his address that the present was a crucial period in the history of the Colony, and he had echoed things that he (His Excellency) had said elsewhere, which were that he then and still believed that they were weathering the storm. British Guiana was doing what she had done before, and was making a solid and tremendous fight against almost overwhelming odds. That they should be able to weather the storm was his earnest hope. The outlook was now brighter than it had been for some time, and one of the greatest points upon which they should rely was the intense interest which was felt (and was still further being stirred up) in the Mother Country. They had ruling over their destinies a Minister of the Crown who took a special interest in all the Colonies, and he thought that the actions of that Minister had shown that without undue interest being taken in any particular Colony, he had shown as much interest in British Guiana as he had in the whole of the others put together. That was a great advantage which they could not too highly appreciate. For a long time it had been felt that many people did not know where British Guiana was, and if they did, they knew it was a small Island in the West Indies. Such had been said often—and he believed the oftener it was said the better—because they would then come before England, Europe and the world, not as a West Indian Island, but as a vast province in South America. He would not take up their time longer except to refer to the word "Society" under which they sat. "Society" was a gathering together, and he thought their interests and the interests of their great Province would be more surely advanced by their thinking over and recognizing what the word meant. It was a joining together of their interests, and united they would stand but separate they would fall. So they should stand united, working together to further their mutual interests, and to encourage the rice, corn, sugar, and tobacco industries, and anything and everything that would further advance their welfare; they should join together in working to secure that happy result which would again make the Colony hold up its head high amongst the colonies and dependencies of Britain and the nations of the world. That they would achieve that result in time he felt certain. He did not think such a great territory and so productive and wonderful a land could possibly sink into obscurity. Such might happen if they did not put their shoulder to the wheel and unite together for the advancement of their interests: but that they would do, for he believed a harmonious and friendly feeling

existed between them. At any rate, friendship and goodwill had been extended to him, and he was sure that they all recognised the advantage of unity and good fellowship amongst each other. They did not see that fighting spirit which sometimes existed in other communities and tended so greatly to their disadvantage. If they worked harmoniously together he believed that the wealth of their land would be preserved, that the prestige of past years would be maintained, that the hopes of the future would be realised, and that British Guiana would still flourish and again be prosperous.

On the motion of Mr. R. G. Duncan, seconded by the Hon. B. Howell Jones, a cordial vote of thanks was given to the retiring President, who was duly elected Vice-President for the ensuing year. The other Office-Bearers, as per annexed list, were then elected (see over) :—

The Thanks of the Society were accorded for the following donations :—

Mr. S. G. T. Bourke—Autograph of Lord Nelson.

Mr. F. C. Campen—Photo Views of Penang.

Mr. B. R. Body—Breen's History of St. Lucia.

Revd. L. Crookall—"Topics of the Tropics."

Mr. Æneas D. Mackay—Canada Year Book.

Mr. Quelch reported the following donations to the Museum, for which also a vote of thanks was accorded :—

Three views illustrating some aboriginal stone carvings in Jamaica, from the Jamaica Museum: a mottled red boa (rare) from Berbice, presented by Dr. Ireland; a piece of the first submarine single wire cable which was laid between Dover and Boulogne in 1850 and which was used only a few hours; a piece of the present Dover-Boulogne Cable, and a piece of the Atlantic Cable attempted to be laid about 1857 and which broke on account of its weight. The last three mentioned articles were presented by Mr. A. J. Collier. Other gifts were a large elephant beetle from Cuyuni, presented by Mr. D. A. Worsley a stone implement from Trinidad given by Mr. Wainwright; three curious balls said to be of grass, hair and earth, taken from

the stomachs of cattle in Venezuela, also given by Mr. Wainwright; eleven pieces of miniature pottery presented by Mrs. Shanks; face of an official envelope circulated in Massachusets State during the Civil War, presented by Dr. Anderson; two eggs of the Flamingo from the North West District, rather scarce, presented by Mr. C. A. Lloyd; large brain stone coral and calcite, from Barbados, presented by Mr. D. Carter; a Jamaica penny, half-penny and farthing, presented by Mr. J. H. Hinds; and two shells, fresh water mussel, from Trinidad, presented by Mr. J. H. Hart. He would also like to mention as on the way from England, a selection of Photographs taken during the Roraima trip by Mr. Frederick McConnell, and enlarged by the Stereoscopic Company. The cost to Mr. McConnell would be something like £200 when they were complete, and he intended to present them to the Museum. Being permanent views they would serve to illustrate perhaps when the Indians had disappeared, what they were like.

The meeting then terminated.

Office-Bearers for 1896.

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